A CHILTON PUBLICATION

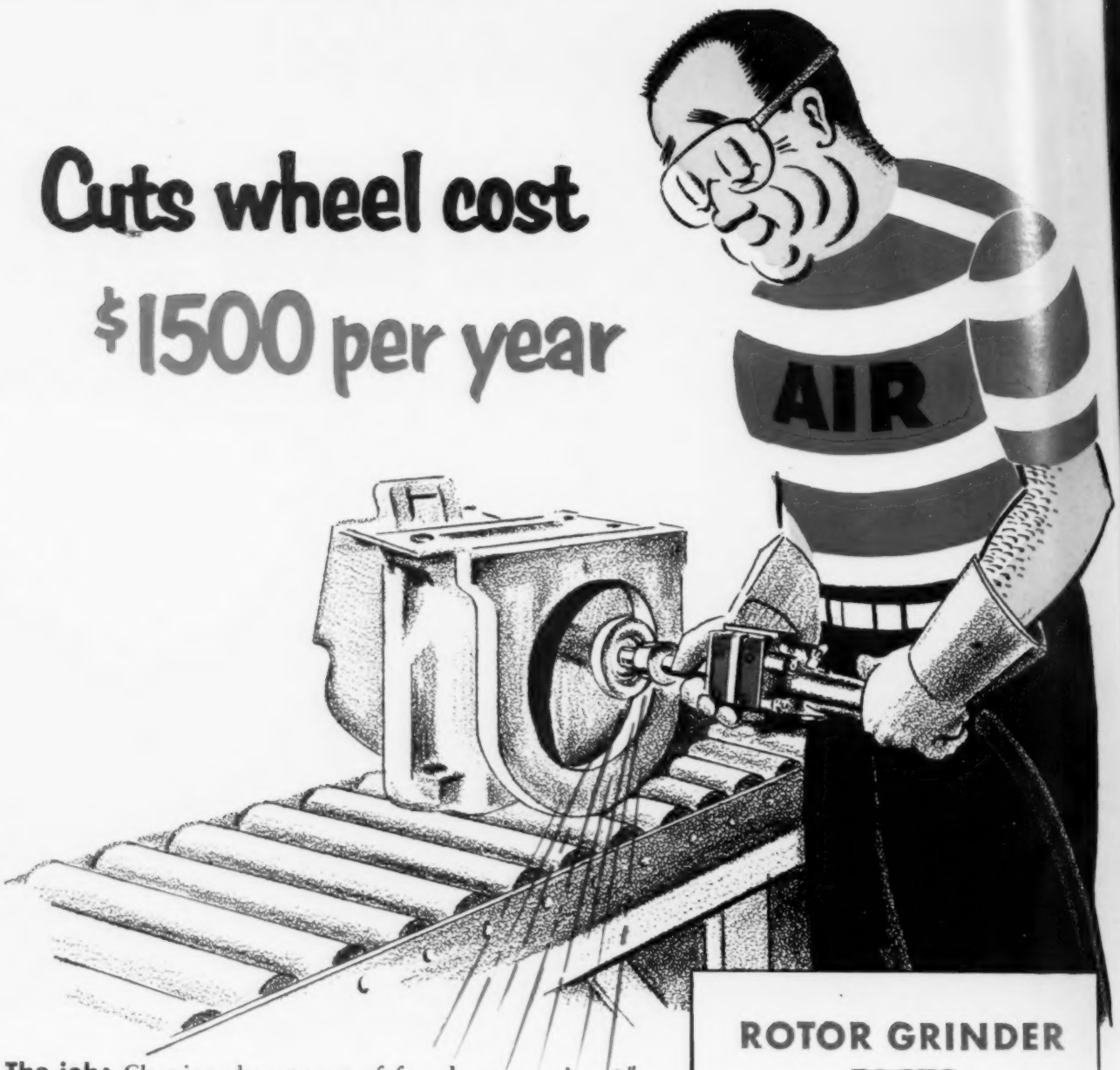
The Iron Age

E NATIONAL METALWORKING WEEKLY

October 15, 1953

ENTS PAGE 2

Cuts wheel cost $1500 per year



The job: Cleaning department of foundry was using 8″ wheels with 4500 rpm grinders. When worn down to 5″ or 6″, wheels lost surface speed and metal removal dropped off. Wheels were laid aside or thrown away at this point.

Solution: Rotor Analyst suggested use of two Rotor 6000 rpm air grinders to use up discarded stub wheels.

Results: Investment of $400 in new Rotor Grinders saves $1500 yearly in wheel costs.

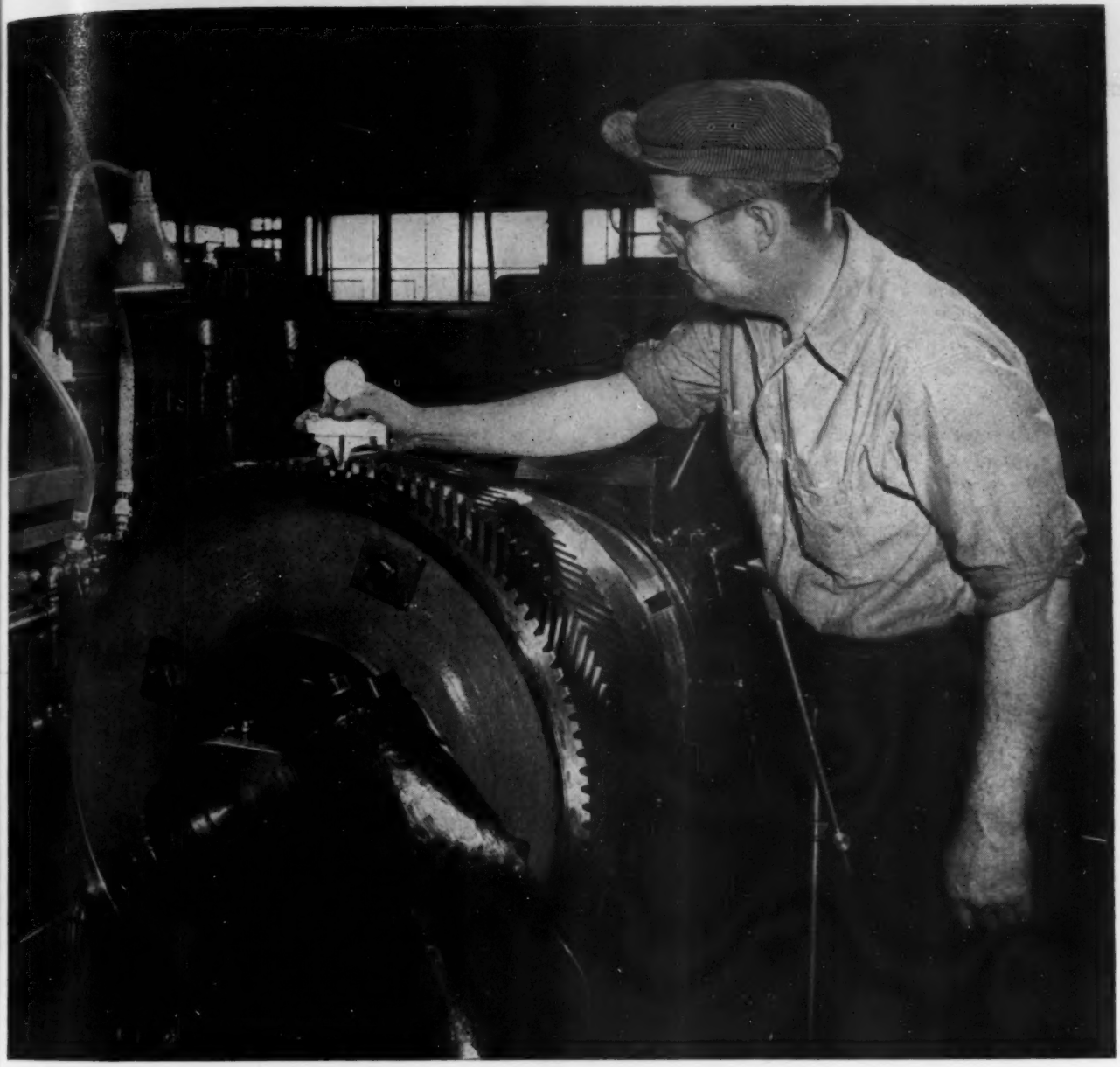
How much will this idea save in *your* plant? Ask your Rotor Analyst for a trial grinder to find out!

ROTOR GRINDER FACTS

Rotor D125—6000 rpm—9¾ lbs.
Rotor D88—6000 rpm—9 lbs.

Others from 3100 to 20,000 rpm. Straight or spade handles. Ask for Catalog No. 38.

THE ROTOR TOOL CO.
CLEVELAND, OHIO
UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



Customers Tell Us Why They Like These Gear Blanks

Not long ago, we decided to investigate customer opinions of Bethlehem forged-and-rolled gear blanks. We asked some pretty direct questions, two of them being "Why do you specify Bethlehem gear blanks? What advantages have you found in these products?"

Here are a few of the answers:

☆ "Ease of machining and uniform finish allowance on OD, bore, and faces."

☆ "The solid, clean metal in the forged blanks is particularly appreciated in tooth-cutting operations on herringbone gear generators, gear shapers, or hobbing machines."

☆ "Fewer finishing cuts are required, and the cutting speed is usually higher."

☆ "There is almost never a rejection after cutting gear teeth."

☆ "The uniform finish allowance all over permits fast, uniform chucking or mounting in the machine."

☆ "The blanks are stronger, sounder, better able to withstand shocks."

The chances are, you would find Bethlehem forged-and-rolled blanks equally advantageous in meeting your own requirements. They are available in sizes from 10 to 42 in. OD, heat-treated or untreated, and are strongly recommended for spur, bevel, miter, and herringbone gears. Why not investigate? We feel that your own experience with these blanks will bear out fully what other users say about them.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

The Iron Age

Vol. 172, No. 16, October 15, 1953

★Starred items are digested at the right.

EDITORIAL

NEWS OF INDUSTRY

NEWS ANALYSIS

TECHNICAL ARTICLES

MARKETS & PRICES

REGULAR DEPARTMENTS

INDEX OF ADVERTISERS 186

THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, $2.00. Cables: "Ironage." N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

DIGEST of th

NEWS DEVELOPMENTS

STEEL UNION FROWNING ON WILDCAT STRIKES—P. 55
"When a union member, or small group of members, decide that they are bigger than their union, stronger than the company, and are at liberty to ignore and break a legal contract. . . They had better go have their heads examined." This quote from a USW paper shows growing union impatience with wildcats.

TRUCK TRAILERS RIDE RAILS TWO BY TWO — P. 59
General Motors' Electro-Motive Div. has unveiled a new flat car designed to carry two truck trailers instead of one. Raised capacity aids rail-truck shipments revenue. GM will either build or license its designs, while Rail Trailer Co. has $28 million in tax writeoffs to cover car purchases.

CITIES, STATES TIGHTEN AIR POLLUTION LAWS—P. 64
A growing number of smoke hunters call the average householder as much an air polluter as industry. But industry is going to be under even heavier fire to improve cleanliness of discharges. Equipment is improving and skies are really bluer—but several cities and states are clamping down.

INDUSTRY SHARES IN WEAPONS RESEARCH — P. 65
Private industry may get as much as 60 pct of Defense Dept.'s weapons research funds this fiscal year, estimates Donald A. Quarles, Assistant Defense Secretary for Research & Development. Private firms make vital contributions in management know-how, continuity of control. Wilson denies slighting basic research.

FACELIFTING UPLIFTS AUTO SALES HOPES — P. 70
Everyone knows that an individual automaker can't bring out an entirely new car each year. Costs are prohibitive. New tooling alone can approach $100 million. Even though he is tied to the same basic model, the manufacturer must make changes. Typical facelifting jobs will be found on most '54 models.

LABOR SECRETARY IS MIDDLEGROUND CHOICE — P. 75
President Eisenhower's choice of James P. Mitchell, career labor relations man, as Secretary of Labor last week filled the vacancy left by Martin P. Durkin. The selection won't please all labor or all management. Meanwhile, Treasury Secretary Humphrey asked an even closer watch on spending.

the Week in Metalworking

ENGINEERING & PRODUCTION

BETTER PROTECTION WITH VPI WRAPPING — P. 111
Protection of finish-machined shafts is afforded by vapor-protective wrapping paper. Handling cost is reduced and many manhours saved. VPI paper is used for internal storage, and for domestic and foreign shipments. Elimination of cleaning parts more than pays for the cost of the paper.

ANALYSIS METHOD AIDS PERSONNEL PROBLEMS—P. 114
A simple analysis method is giving management more answers on problems involving personnel. Known as Activity Vector Analysis, it yields revealing personality profiles in evaluating capacity and potential of new and established personnel. It shows probable behavior in a given situation.

ORGANIC FILLERS SEAL DEFECTS IN METALS—P. 118
Two groups of organic fillers—one for sealing microdefects and the other for large defects—are used for salvaging rejected cast and welded parts. These materials, being thermosetting, harden fully and do not soften when reheated. Repaired areas can be machined by conventional methods.

AISE STRESSES NEED FOR HIGHER EFFICIENCY—P. 122
Off-the-cuff remarks between technical sessions at the AISE meeting in Pittsburgh emphasized the need for more efficiency to offset volume loss in steel production. Some observers think foreign competition is threatening domestic production. Much of this steel is produced in U.S.-made mills.

FLEXIBLE TOOLING MAKES VARIETY OF PARTS—P. 126
Tooling innovations have increased Buick's output of replacement parts. A drill press uses air cylinders to synchronize dial indexing of parts with spindle movement. Coining with carbide dies replaces grinding of camshaft spacer rings and steps up output 4.5 times.

NEXT WEEK—CAST REFRACTORIES DECREASE COSTS
All-cast heat-treating furnaces offer the possibility of better balanced operation, low heat loss and high output. Elimination of brick construction substantially reduces overall costs and construction time. Repairs are made easily if necessary, but 8 months' operating experience show no difficulties.

MARKETS & PRICES

FREE MARKET NICKEL PRESSURE BUILDS UP — P. 53
Nickel users may have been hurt by controls but they are far from dead. Though decontrol won't be effective till Nov. 1, consumers are already pressing suppliers heavily. There still won't be enough to go around for months but users will fare better with the free market. Conversion is alive.

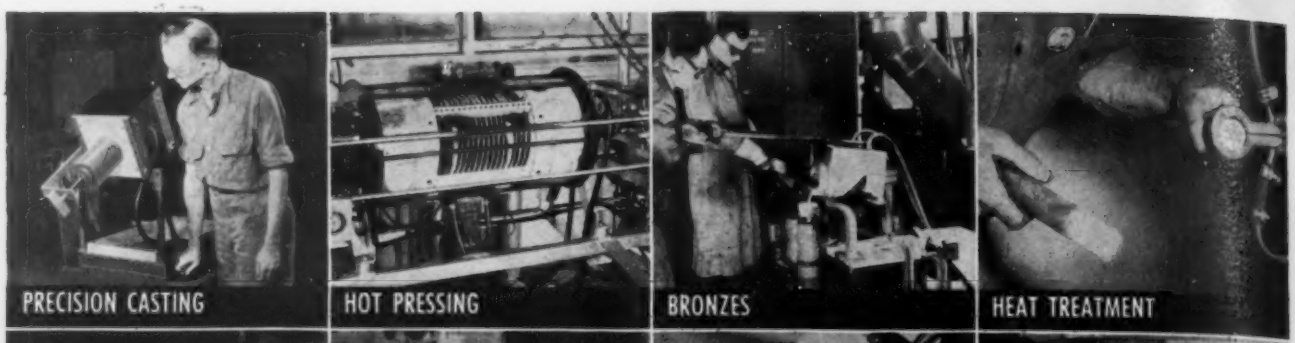
INDEPENDENTS' SHARE OF CAR OUTPUT LAGS — P. 57
Rumors of a merger of two automotive independents whirled around Detroit last week. They met with the usual denials that always follow rumors of any impending marriage of convenience. The story involves Hudson and Nash, had more substance than most. It spotlights the drop of independents' share of output.

THERE'S NO PANIC AMONG TOOL BUILDERS — P 81
Although new orders in the machine tool industry are not keeping pace with shipments, the drop in backlogs does not seem to be provoking undue pessimism on the market outlook. A breathing spell could be welcome—if it doesn't pinch too hard. Subcontractors are the first to feel the lull.

INDUSTRY HAS BIG STAKE IN HOMEBUILDING — P. 83
Homebuilding is simultaneously a cause and symptom of prosperity. It broadens and fortifies the market for consumer goods. Now homebuilding is lagging—perhaps prematurely. It has enough economic impetus to keep it high next year. Judicious stimuli may be needed. What spurs building. How industry can help.

STEEL BUSINESS STAYS AT VERY GOOD LEVEL — P. 153
The steel industry was one of the first to feel the correction period, and it seems to be coming through it with flying colors. Prospect is that operations will average close to 90 pct through the last quarter of this year. And they'll probably be at least that high through the first quarter of next year.

U. S. CHARGES MONOPOLY IN LEAD INDUSTRY—P. 156
Attorney General Herbert Brownell announced filing of antitrust suit against American Smelting & Refining and St. Joe Lead. Firms wait to comment. Unofficial Santiago reports indicate Chile copper will be sold for 30¢ per lb. Zinc smelter stocks zoom to 141,494 tons, highest since August 1947.



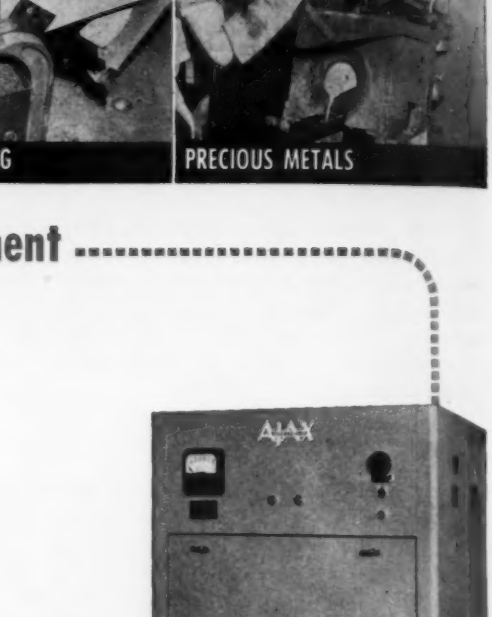
"In Production" — with Minimum Investment

AJAX-NORTHRUP Converter-Operated FURNACES

The 20 kw. converter will melt 17 pounds of steel in 40 minutes. Maximum capacity is 30 pounds of steel or 60 pounds of bronze. The larger 40 kw. unit melts faster, will handle up to 50 pounds of steel. The 6 kw. unit melts a pound of steel in 8 minutes. Controlled temperatures to 4500 deg. F and higher make these furnaces ideal for sintering and hot pressing carbides.

Ajax-Northrup converters are compact and self resonating. They require no special foundation or wiring—and they're certified to meet F. C. C. regulations.

Thousands of these units are in daily use. Many of today's prominent industries actually got their start with an Ajax-Northrup 20 kw. converter. Write for bulletins.



20 KW CONVERTER

Since 1916

AJAX NORTHRUP

INDUCTION HEATING AND MELTING

AJAX ELECTROTHERMIC CORPORATION
Ajax Park, Trenton 5, New Jersey

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AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

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THE IRON AGE

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The Babel Has Subsided

PRESIDENT EISENHOWER has told his official family to button up its collective mouth on the atomic weapons rhubarb. Future statements, if any, must be cleared with the Atomic Energy Commission. In case you missed some of these off-the-cuff statements here were a few of the choicest:

"Soviet Russia is capable of delivering the most destructive weapon ever devised by man on chosen targets in the United States."—Mobilization Chief Arthur S. Flemming.

"I think they [the Russians] are 3 to 4 years back of where we are . . . to say they've got bombs ready to drop and airplanes to drop them with I would personally doubt a little."—Defense Secretary Charles E. Wilson.

"An atomic war with Russia is inevitable."—Civil Defense Administrator Val Peterson.

In addition to these statements from Administration people, there were the following:

"I don't find it hard to choose between financial ruination for my country and atomic devastation."—W. Sterling Cole, Rep., N. Y., and Chairman, Joint Congressional Committee on Atomic Energy.

"Russia has the capability today to hurt us badly and . . . within 2 years will have capability to virtually destroy us if she moves fast."—Gordon Dean, retired AEC Chairman.

"No absolute security is possible; there never has been such a thing. In the age of atomic and hydrogen weapons . . . it is even less possible than in the past."—Hanson W. Baldwin, Military Editor, *The New York Times.*

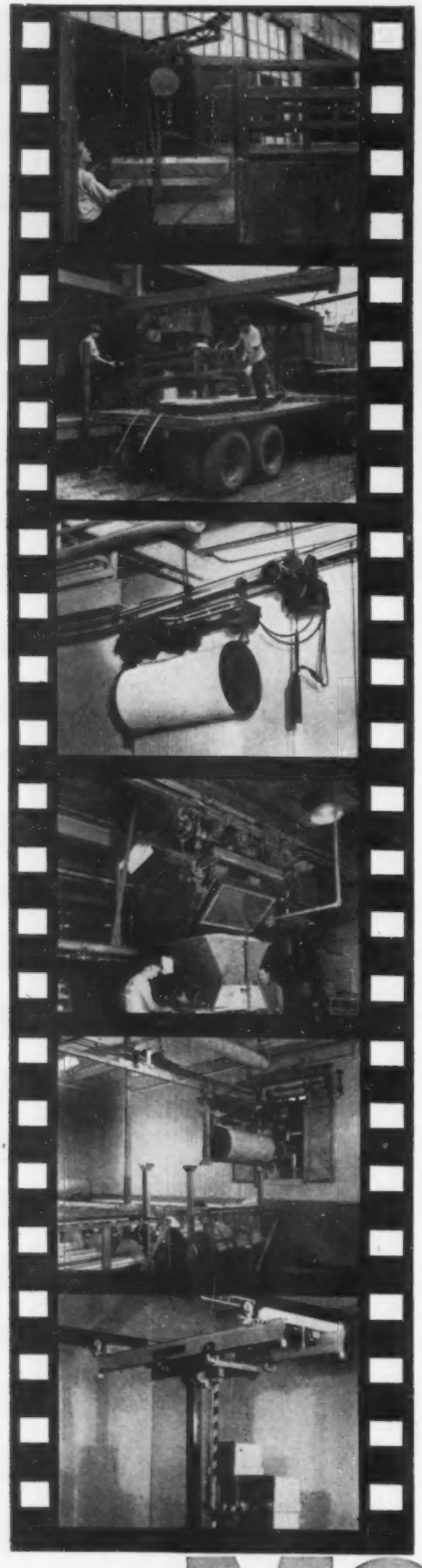
In his encounter with the press last week—following the rash of statements for the benefit of Mr. Average American—President Eisenhower clinched matters.

The President said that the Soviet Union now possesses a stockpile of atomic weapons of conventional type and a weapon or forerunner of a weapon far more powerful than the conventional atomic bombs. He pretty well cut the whole argument off by saying that the Soviets now have the capability of atomic attack on us and that it will increase with the passage of time.

For our part we like Mr. Baldwin's quote the best of all and suspect that the average American pretty much agrees with him.

Tom Campbell

Editor



Quickly removes die blocks from trucks

Saves $30 each truck unloaded

Delivers beams to another building

Automatic delivery of core sand

Automatic transfer of slasher beams

Stacker crane increases storage by 60%

a 16 mm movie that discusses handling problems common to every industry

Before you decide upon any material handling equipment, let us loan you "Up and Over". This 16 mm film shows many installations of American MonoRail overhead handling equipment. You will see hand operated to fully automatic systems—one or more that may be particularly adaptable to your operations. The film is educational, interesting, informative and shows the way to economical, safe and time-saving material handling. Your ticket of admission is only a note to us asking for a print. It will help us if you advise the exact date, as close as possible, when you wish to use it.

THE AMERICAN MONORAIL COMPANY

13103 ATHENS AVENUE — CLEVELAND 7, OHIO

Dear Editor:

Letters from readers

While You Are Waiting

Sir:

May we reproduce in our house organ—which goes to investment dealers and brokers all over the United States—your editorial in the Sept. 24 issue—giving full credit, of course?

K. S. GASTON
Chairman

Distributors Group, Inc.
New York, N. Y.

Fire!

Sir:

Can you furnish me with more details on the fire protection article which appeared in your Oct. 1 issue? Specifically, where can Mr. Stecher's book be obtained?

EDWARD EHLERS, JR.
Glen Ridge, N. J.

Sir:

Your special report article on "Fire!" page 36a of your Oct. 1 issue is excellently done.

Could you please send us three tear sheets of this article?

C. O. PARROTT
Advertising Dept.

G. O. Carlson, Inc.
Thorndale, Pa.

Gilbert E. Stecher's "Fire Prevention and Protection Fundamentals," is published by Chilton Co., 56th and Chestnut Sts., Philadelphia 39, Pa. Price is $10.—Ed.

New Painting Method

Sir:

We have read in your Aug. 13 issue on p. 177 the description of a new painting method as developed by Bede Industrial Products, Inc. Being interested in such apparatus, we would like to write to them. We would, therefore, appreciate your forwarding us the complete address.

F. A. HUEP

Waldorf Instrument Corp.
Huntington Station, N. Y.

The complete address of the Bede Industrial Products, Inc., is 1110 Brookpark Road, Cleveland 9, Ohio.—Ed.

Wanted: Die Casting Machines

Sir:

We shall greatly appreciate it if you will recommend to us some experienced and reliable factories or exporters who can supply machines for manufacturing die cast padlocks, and who can give us technical advice for the establishment of a factory to produce same.

We wish to add that we are now studying a plan for starting a small factory with a daily capacity of producing about 100 dozen of padlocks of both bronze cast and zinc and aluminum cast. Therefore, we are in need of technical advice and the knowledge of cost of machine, etc.

H. CHANG

Dah Yuen & Co., Ltd.
Taipei, Formosa

New Alloy

Sir:

It is requested that this Arsenal be furnished with the name of the company who manufactures Cop-Sil-Loy, a product mentioned in the Sept. 3 issue on p. 182.

C. A. McCARTHY
Supt. Plant Maintenance

Watertown Arsenal
Watertown, Mass.

This alloy is manufactured by Cop-Sil-Loy, Inc., Crossroads of the World, Hollywood 28, Calif.—Ed.

Normalizing Furnace

Sir:

Will you kindly send me the name of the manufacturer of the furnace used for normalizing aircraft tubing without decarburization—featured as an item on the Newsfront page of your Sept. 17 issue?

A. S. ROSE
Engineering Dept.

I-T-E Circuit Breaker Co.
Philadelphia, Pa.

The furnace manufacturer is the Surface Combustion Corp., Toledo 1, Ohio.—Ed.

Radiography

Sir:

We noted in the Sept. 10 issue of your magazine information on industrial radiography development through the use of isotopes.

We would like to have additional information as to whom we should get in touch with in order to secure information on this interesting subject.

LUIGI MAJNO

Metalnova
Milan, Italy

We sugaest you contact the Radioisotope: Division, U. S. Atomic Energy Commission, Oak Ridge, Tenn. for further information. —Ed.

Spectrochemical Techniques

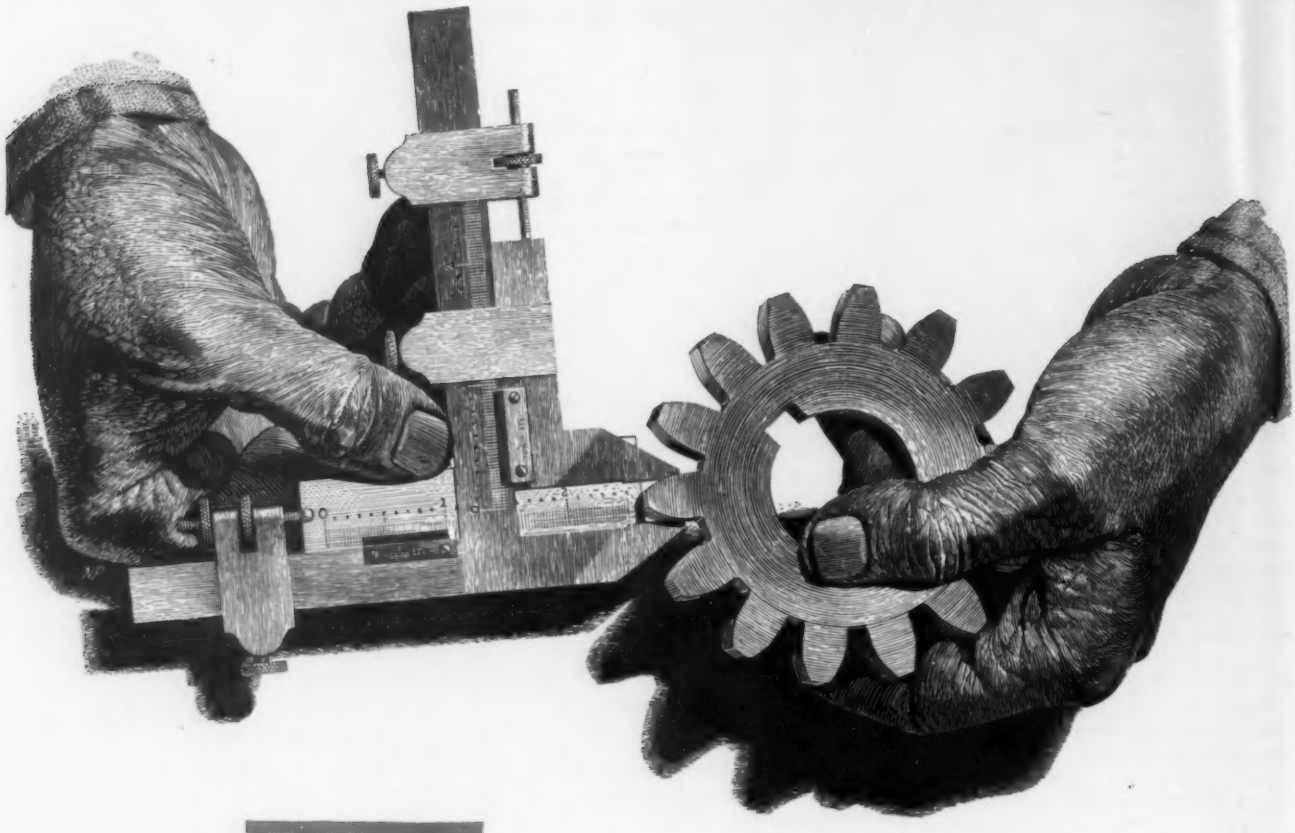
Sir:

In your Sept. 17 issue, you published an article entitled "Spectrochemical Techniques Advance Titanium Technology," p. 166-170.

We are interested in obtaining 10 tear sheets of this article.

M. LONNER

Philipp Brothers, Inc.
New York, N. Y.



Like a precision gear . . .

STEELMAKING, TOO, REQUIRES EXACT MEASUREMENTS

Whatever your requirements for formability, uniformity, or drawing qualities, you'll find J&L Sheet & Strip . . . accurately and faithfully produced to meet your specifications. Complete understanding of the end-use of the sheet or strip you order is a rigid requirement of J&L production. You can depend upon J&L products to fit your production line.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

J&L STEEL

Fatigue Cracks

by William M. Coffey

Outside the Iron Age

The Iron Age reaches to the far corners of the world, natch. It reached a young man in Germany who wants to come to America. He wrote us this letter:

Dear Sir:

I have reading your magazine. Now allow please that I supply to you with the following request: I have the desire to travel for several years to the United States. The purpose of which would be first of all to extend my professional knowledge.

However, I can only obtain a visum, if I have a sponsor. I apply to you in all confidence and beg you to help me. Perhaps it is possible that you publish an advertisement in your magazine. Unfortunately there is no possibility to assign the money for the advertisement to the USA. In case I succeed to find a sponsor in this way, I naturally shall render you the expenses later.

I am 24 years of age; engineer and toolmaker by profession. I am working by the firm: Gutehoffnungshutte Oberhausen as a designer for blast furnaces. In the United States I would do a job as toolmaker, repairlocksmith, steelplant—or blast furnace worker or a like job. Perhaps it is possible that my employer be able to give a sponsorship.

Immediately after my arrival I would be able to give the sponsor sufficient security, in cash and in values (about $1,000 dollars) according to written agreement. As a matter of fact, I am quite willing to pay the sponsor an adequate remuneration. I shall endeavor myself to obtain accommodation and board. The sponsor will not have any expenses by this.

I should be very much obliged to you for an answer by return of post. At any rate I beg you to give me an answer before long.

Yours very truly,
Werner Momm

Mr. Momm, your fine letter with this issue reaches 134,619 of the very top people in metalworking in this country—the managers, the engineers, the production heads of 16,751 U. S. plants. It could happen that one of these men will lend a sympathetic ear. Mr. Momm's address is: Oberhausen-Rhld., Osterfelderstra. 22, Germany.

Ah, Bliss

This is long in coming, but we want to put in a plug for our friend Mr. Jim (Upside-Down) Harrington, Advertising Manager of E. W. Bliss Co., Canton, Ohio. Jim, you will remember, writes his letters upside-down because "most people are interested first in who it is from. They already know that it is to them or they wouldn't have gotten it."

Jim is now editing *Bliss Trends*, the company's new quarterly, which tells everybody what's new at Bliss.

Volume 1, No. 1 was certainly a fine start, Jim. It's about time for the next one, isn't it? As Bob and Ray say, "Keep sending the money and write when you get work."

Tool Steel Directory

We made a terrible mistake. We originally ordered about the same number of copies of the Tool Steel Directory as were sold last year not counting on the fact that the many additions and improvements would just about double the demand. So we ran out several weeks ago.

This is just to let you know, however, that a new supply is in and once again available. You'll find this edition uses the new SAE classification system, which means you now get all sorts of additional data on steels, from physicals and chemistry through heat treating and forging temeratures, heat treating mediums, steps to prevent decarburization. Now, it's not only a tool steel directory but a heat treating guide as well. Please send your $2 addressed to me personally. Old car about shot.

Puzzlers

Mr. W. B. Lobbenberg gives us the answer to the Sept. 17th puzzler:

Two thousand Five Hundred and Nineteen men
The Commander had under his lead
One can see that the heat is off again
'cause this was a tough one indeed.

Other less poetical winners: Stan Prifogle, J. D. Irons, Jim Harvener, Edwin J. Montgomery, Z. B. Kopicki, Bob Hatschek, L. G. Bayrer, Kenneth A. Roth, F. R. Hoercher, Lt. Comdr. Garrett, USN, Margaret E. Sutton, Clyde R. Weihe, James M. Talbot and Mr. Rice.

New Puzzler

All except 8 of the livestock owned by Farmer Jones were horses. All except 6 were cows and all except 4 were pigs. How many horses, cows and pigs did he have?

speeds materials handling, cuts maintenance costs

with NEW American DiesELectric

To handle an ever increasing volume, progressive metals handling and processing Northern Indiana Dock Company recently added another American DiesELectric Locomotive Crane.

They chose another American DiesELectric because they knew from their own experience in handling big tonnage of metals, *nothing equals this locomotive crane!*

Hundreds of other American DiesELectric Locomotive Cranes solve similar materials handling jobs for their owners every day quickly, economically. You'll find these cranes in almost every industry . . . steel, railroads, mining, pulp and paper, construction and industrial plants of all kinds.

Fast, smooth-operating American DiesELectric Locomotive Cranes with diesel power to the deck, electric power to the trucks require a minimum of maintenance. In fact, detailed cost and operating records prove an American DiesELectric Locomotive Crane *will write off its cost fully in five short years!*

Does your company have a materials handling problem? Our specialists are at your service! Write or call today!

Modernize...economize...with

American Hoist

AMERICAN HOIST & DERRICK CO. • ST. PAUL 1, MINN.

For the BIG PRODUCTION jobs of industry...

AMERICAN LOCOMOTIVE CRANES

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

MOST SCRAP DEALERS AREN'T PANICKY about recent downtrend in prices. They generally feel judicious operators who have a capital reserve won't have to worry about closing yards. While some "boom time" operators may be forced out, others who have been through the commodity wringer before expect to roll with the rise and fall of prices.

ZONING RESTRICTIONS covering air pollution are becoming increasingly stringent in many areas. Next year Chicago is expected to include for the first time zoning restrictions on smoke producing plants down to the small foundry level.

LIVE STEELMILL SOUNDS will be featured for the first time on a new industrial movie about to be released. In shooting the mill scenes a record 120 million watts of light were used.

RIDING THE REACTION TO FIRE HAZARDS, several firms are giving cutting fluids a thorough going over. Use of water soluble oils poses condensation headache. One firm is now designing a machine which minimizes critical condensation in some applications.

PORTABLE MILLS TO TREAT TUNGSTEN ORES are being used in California by one company. They simplify treatment of ore from small deposits of scheelite not rich enough to warrant shipment to custom plants.

BOOM IN AIR FREIGHT, up 18 pct from last year, still has plenty of altitude. Airlines count on rising surface transportation costs to send more shipping aloft. New business efforts are aimed at commodities such as auto parts which can be shipped in original containers. Lower packaging costs and inventory levels will be selling points.

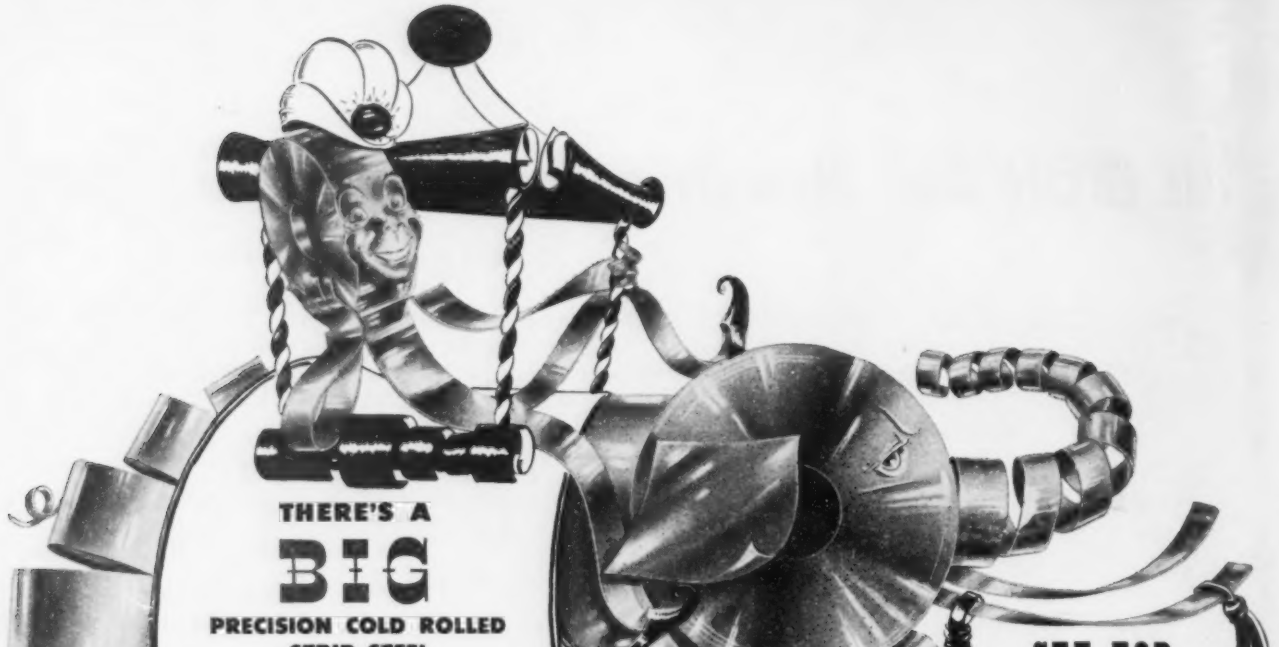
PRODUCERS OF ELECTRONIC ITEMS are meeting demands for skilled metalworkers by putting new emphasis on apprentice training, skill improvement. They're caught in squeeze caused by generally high product demand, technological changes requiring higher skills.

BRAZED LAP JOINTS IN TITANIUM can be made by heating with an oxyacetylene torch, by electric resistance or by inert atmosphere furnace heating. Armour Institute engineers working on this problem have also used a soldering iron.

PRODUCTION OF SMALL, LAMINATED PLASTIC PARTS is making substantial progress in Detroit. Larger steel stampings, including fenders, are not yet successfully duplicated in volume. Production rates are still very low for plastic parts.

ECONOMIES IN SHOT PEENING where used to increase fatigue life of auto parts are possible in many cases recent studies show. Adequate velocity and time are considerably less than generally used and no additional value is obtained by increasing air pressure or exposure after minimum is reached.

USE OF HEAT TREATED TITANIUM alloys in machine tool applications will soon be recommended. Advice will be based on a study of titanium wear and hardness expected to be ready in December. Results of the metal on metal wear tests are reported good.



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NICKEL: Free Market Pressures Build Up

Decontrol effective Nov. 1 but consumers pressing suppliers now . . . Still won't be enough but users will fare better under free market . . . Conversion alive—*By W. V. Packard.*

Nickel users may have been injured by controls but they are far from dead. Decision to decontrol the metal for all but military and atomic energy uses has unleashed market pressures that could only come from free enterprise of the strongest vitality.

Although decontrol action will not become effective until Nov. 1, consumers are already pressing their suppliers vigorously. Result is a great chain reaction passing through consumers, manufacturers, purchasing agents, suppliers and producers.

Everybody wants nickel, and there won't be enough for all for many months. But consumers will fare better in a free market than they have under 3 years of controls.

Urge Higher Nickel Content

Spurred by the strongest competition in years, manufacturers feel a compulsion to make every possible move to improve the appearance and lasting utility of their products. In many cases this means use of more nickel or return to nickel from makeshift substitutes that may or may not have worked well.

So it's not surprising that top management is exerting terrific pressure on purchasing agents to get more nickel in their products. Purchasing agents in turn are pressing suppliers of nickel-plated and nickel-stainless steel parts. And the pressure is multiplying through secondary and virgin nickel markets.

Nickel and nickel parts suppliers were well aware of the strong pent-up demand which existed for their products. Yet they were caught flat-footed by the sudden emergence of vigorous procurement action by their consumers.

They are hastily but patiently trying to correct the "erroneous impression" that decontrol means nickel supply has suddenly taken a turn for the better. Consensus of their statements: "There isn't enough nickel in sight to meet demand, but we'll distribute every pound we can get as equitably as possible."

Conversion Comes High

Such "assurances" do not always satisfy customers who are seeking firm delivery promises.

It's a safe bet consumers will continue to play the nickel conversion market for all it's worth. Nickel conversion works like this: A plater or manufacturer obtains some "free" nickel for two or three times the regular price. He then pays a plating supplier 20 to 30¢ to convert it into plating anodes. From there on it's routine.

Yield More Stainless

THE IRON AGE has been able to verify conversion anode costs as high as $3 per lb, compared with 85¢ through regular channels. However, a more typical cost of conversion material would be in the neighborhood of $2 per lb.

Now that end-use restrictions are to be abandoned, competition among users will bring about some increase in total supply. In addition to pressing regular suppliers, they will intensify efforts to procure nickel from foreign sources and from irregular domestic sources.

In some cases freedom of use

Nickel Users Play Conversion Game

- **Nickel anode cost through regular channels=85¢ per lb**

  BUT . . .

- **Supply is far short of demand**

  SO . . .

- **Many users have turned to conversion deals**

  HOWEVER . . .

- **Nickel for conversion costs=$1.75 per lb**

  PLUS . . .

- **Anode conversion charge of 25¢ per lb**

  THUS . . .

- **Total conversion anode cost=$2.00 per lb**

Note: Cost figures are average, may vary with area, circumstance.

will permit substantial increases in production of nickel-bearing products without increasing the total amount of nickel consumed.

A good example is the stainless steel industry. It has learned how to make good austenitic stainless steels with much less nickel than had previously been required. (THE IRON AGE, May 14, 1953, p. 129.) Even before Korea its metallurgists had done considerable development work with chrome-manganese (low nickel) steels. Under current restrictions a good austenitic stainless containing less than 1 pct nickel has been produced.

But metallurgists know a better one can be made with slightly more nickel. At least one major stainless steel producer has been planning to push a new family of chrome, manganese, nickel steels. Since they would have only about half the nickel content (4 pct) of the standard 18-8 (chrome nickel), twice as much stainless could be made with existing nickel supplies.

You can be sure decontrol action will also bring about some rapid reshuffling of markets.

Platers will be driving hard for automotive and other applications where straight-chrome stainless, zinc, or other materials had been substituted.

Woo Old Users

A lot of auto brightwork that used to be nickel plated is now stainless steel strip, accounting for the biggest use of that product. But platers have never stopped considering this their market. They now feel that cost advantage will be a big factor in helping them win it back.

They're planning to move back into other markets, too. For example, a manufacturer of hand tools who had been forced to convert from nickel to zinc finish, is now going back to nickel.

Meanwhile, stainless steel producers will be aggressively moving back into other markets which have been denied them by government restrictions. An example is stainless steel curtain walls for building exteriors. After undertaking extensive development and promotion of this application, the industry had to go slow after shooting started in Korea. Stainless curtain walls will be back.

Greatest confusion is found among users of plated or stainless products. In the auto industry decision will have to be made whether to do a good job on plated bumpers and other parts that get tough usage, or to spread available nickel on non-functional parts.

How About Brightwork?

Under restrictions a maximum thickness of 0.001 in. of nickel was permitted on automotive brightwork, and then only on bumpers and a few functional parts. A flash of 0.00005 in. was permitted on other brightwork. Free market bumpers had an average thickness of nickel of 0.0015 to 0.0025 in. in the case of Cadillac.

Users are concerned about gray market prices. At the same time they point out that cutback auto output may keep demand within reasonable bounds and prevent runaway prices.

Buyers are trying to insert old specifications into purchase orders for plating. But there is so much uncertainty about supply that no one really knows how successful he will be.

"He's doing the best he can—that's the whole trouble."

Military and atomic energy requirements will continue to take close to 40 pct of regular nickel supply, although there is a prospect for gradual decline in the former. In addition, the government will insist on carrying out a "minimum" program of buying for the strategic stockpile.

Stainless:

Industry gets shot-in-arm from end of nickel controls.

Stainless steel producers believe lifting of controls on civilian use of nickel will give the industry a much-needed shot in the arm.

Generally, stainless producers look for a pickup in business when the nickel-chrome grades become available for civilian purposes after Nov. 1.

Producers say controls tended to aggravate a slow market for stainless. Inability to obtain needed 18-8 steels forced some consumers to switch temporarily to substitute materials. They either couldn't use or preferred not to use the chrome-manganese and straight chrome grades.

Another factor was the public discussion and speculation that preceded announcement that controls will be lifted. Consumers who were using substitute grades withheld orders and reduced inventories and waited for decontrol.

Even with controls ended, some users may have to stick with substitute grades for the time being. Reasons for this include:

(1) The government will continue to add nickel to the defense stockpile, and

(2) Mills may not receive as much nickel for steelmaking as they did under allocations, even though more nickel will be available this year than last (an estimated 20 million lb more). This is because electroplaters, pretty much out in the cold under controls, may receive a bigger share of the nickel supply after Nov. 1.

STEEL: Union Frowning on Wildcats

What one local union leader had to say about illegal strikes . . . Union reaches out for recognition as responsible agent . . . Wildcat causes antidotes—By J. B. Delaney.

"When a union member, or small group of members, decide that they are bigger than their union, stronger than the company, and are at liberty to ignore and break a legal contract, binding in the eyes of the law, then my advice to them is: They had better go have their heads examined."

If those remarks had come from a court bench or a company president's office they would have raised no eyebrows. But they came instead from a front page editorial in the March 1953 issue of *The Aliquippa Steelworker*, published by Local 1211 CIO United Steelworkers of America.

Union Impatience Grows

Signed by Anthony Vladovich, Local 1211 president, the editorial amounted to a public spanking of union members participating in a series of wildcat strikes at the Aliquippa plant of Jones & Laughlin Steel Corp.

Today Mr. Vladovich's editorial sentiments reflect a growing union impatience with workers who hotheadedly ignore contract provisions for peaceful settlement of disputes. The union attitude was crystallized in a recent statement by David J. McDonald, International Union president, when he ordered wildcat strikers at Bethlehem Steel's Lackawanna plant to return to work.

A survey by THE IRON AGE indicates management and union are beginning to merge views on the wildcat strike problem. Apparently the best approach calls for union discipline of wildcat strikers and union refusal to support clearly illegal strikes.

With the growth of union prestige has come union recognition that labor must act as a responsible agent. This is not a case of the leopard suddenly changing its spots. Union determination to quell irresponsible action has been mounting gradually over the years. Living up to a legal contract is a positive way to prove responsibility.

Wildcat strikes often start over relatively minor problems, keep the harmony of labor-management relations constantly sour. They are too often demonstrations of unruly force rather than a demonstration of headquarters union authority and solidarity. Even the price of strategic wildcat strikes to soften up management just before negotiation time may become too high for labor to pay.

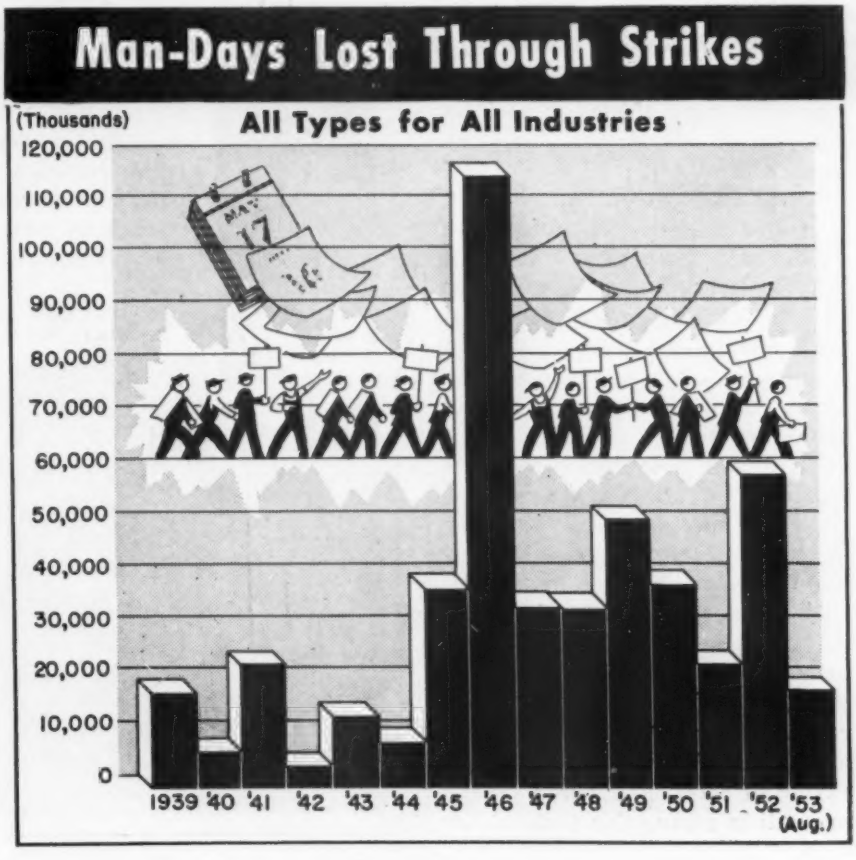
One industrial relations executive summed up his feeling this way: "We believe emphasis should be placed on a continuing educational program to the effect that contracts are obligations which should be met. Also, a tighter control by the International Union of some of its local union officers would further improve the situation."

Economic losses caused by wildcats are substantial, but figures are not available. The U. S. Bureau of Labor Statistics explains it keeps no such records because "it is extremely difficult to be sure in some cases whether strikes are authorized or unauthorized."

Wildcat Strike Causes

Last spring 1500 workers of the Union Railroad, serving Pittsburgh district plants of U. S. Steel Corp., struck over the disciplining of two men for a slowdown. Railroad union leaders later admitted the strike was wildcat. But before it was settled, the strike had cost 125,000 tons of steel production, 90,000 tons of coal, the furloughing of 40,000 steel workers and miners, and loss of $2.5 million in wages.

Between January and mid-June of this year, Youngstown Sheet & Tube Co. lost more than 80,000 tons of steel due to strikes and slowdowns. Employees lost close to 9000 man-days of work. Most of



the trouble centered about incentive programs.

Chief causes of wildcat strikes in steel include disputes over: (1) Incentives, (2) size of working forces and filling of temporary vacancies, (3) discipline and discharge cases, and (4) scheduling and seniority.

Union Job Security

Sometimes, spontaneous strikes are recognized by management as justified. As an example one company cited a strike over unsafe working conditions. The men returned to work when the condition was corrected.

A large company outside the steel industry believes union organizational set-ups are partly responsible for wildcat strikes on the local level. This company advocates greater job security for local union officials, who now must stand for re-election every few years.

The firm has experienced considerable trouble around union election time when the "ins" are selling the membership on what they will do for them, and the "outs" are saying they'll do more.

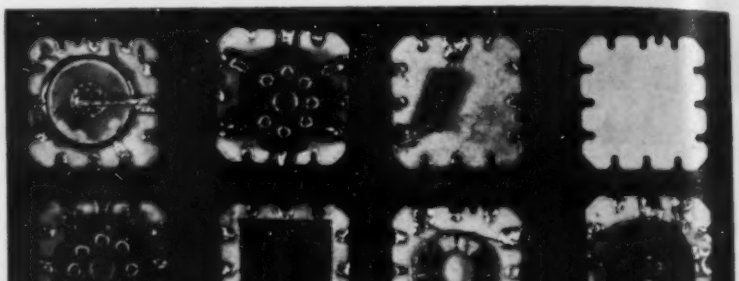
Steelworker Layoffs Temporary

Cutbacks in automotive steel inventories were blamed by at least one major steelmaker for temporary layoffs.

Great Lakes Steel Corp., Detroit, a major supplier of automotive steel, said temporary layoffs of 600 employees last week were due to current adjustments in inventory and model changes by its customers. Full employment was expected to be resumed in a matter of weeks.

Layoffs all occurred in the merchant mill section where rounds, flats and special shapes are produced for auto bumpers, wheels, and other parts.

This is perhaps the first instance of steel layoffs attributed directly to a slackening of automotive demand for steel. But it is significant that sheet production was not affected. In spite of the current easing of steel, cold rolled sheets are still in strong demand.



WAFERS mounting various electronic parts are made automatically.

Robot Line Builds Electronic Units

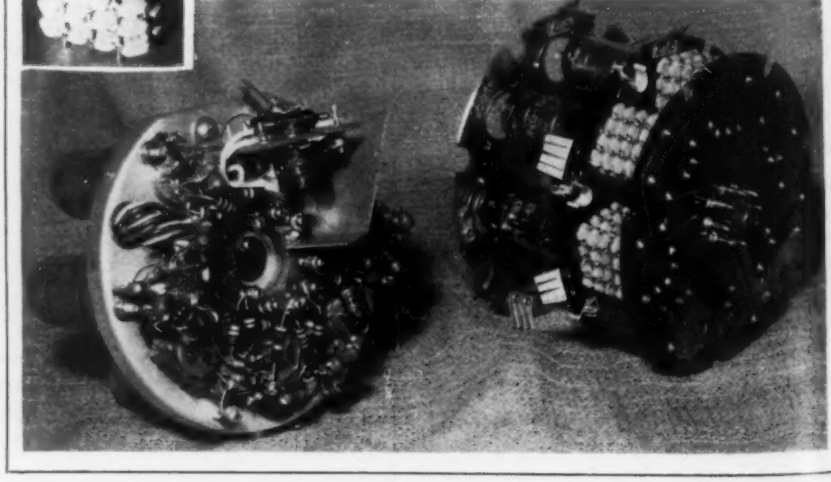
Manual wiring of electronic circuits is a tedious procedure. Printed circuits added some speed but now Bureau of Standards has perfected an automatic assembly line for producing complete electronic subassemblies. This holds promise of great savings of time and money in production of both military and civilian equipment.

Starting with raw or semi-finished materials, the pilot line produces wafers, tube sockets, resistors, capacitors and printed circuits. It assembles these into compact units and inspects each one electronically.

Since many basic circuits involve only different component values, standardization is possible. A ceramic wafer with one or two tape resistors or capacitors is the prime building block. Special parts such as tube sockets, coils or potentiometers may also be mounted.

Several of these parts-mounted wafers are stacked together and linked both physically and electrically by wires soldered automatically into pre-tinned notches in the wafers. Where a connection is not desired, the wire is cut. Finished stack is called a "module."

In final assembly several modules are mounted on or between copper-clad base plates with circuits etched into the copper. These connect riser wires and complete the circuit. Several of these may form a piece of equipment.



MODULE (left) goes into subassembly (right below) compared with identical unit wired by hand. (bottom left).

INDEPENDENTS: Share of Output Lags

Hudson-Nash merger rumors spotlight drop of independents' share of production . . . Next year will be tougher . . . Packard gains while Big Three strengthen—*By R. D. Raddant.*

Rumors of a merger of two automotive "independents" whirled around Detroit's automaking social circle last week.

They met with the usual denials that always follow rumors of an impending marriage of convenience. No one wants to admit he will have to compromise on his goals or that he is in trouble.

There has already been one merger of convenience this year, when Kaiser bought out Willys. It eliminated two independents from the list of merger eligibles, narrowed the prospects to Hudson, Nash, Packard and Studebaker.

Rough Time in '54

The fact that merger rumors do occur intermittently points to the economic situation of most independent auto manufacturers today. It can't be said that any is in a desperate plight financially, but signs point to a difficult time next year.

Last week's story involving Hudson and Nash had more substance than most. A. E. Barit, Hudson president, said that if his firm "ever should merge with another company or companies, the merger will preserve the identity of Hudson in every respect."

More pertinent was the comment by George W. Mason, Nash-Kelvinator president, that "interchangeability of parts can be obtained without mergers."

Even Studebaker Cuts

The latter statement should be considered as more than a straw in the wind. Cost of manufacture of parts is important to the smaller automaker and interchangeability might be a logical step toward cost cutting.

It's just possible that some sort of an agreement short of a merger could be forthcoming any day.

How serious is the situation for the independents anyway?

It is true most of them show production gains over last year, but the percentage of gains lags far behind their Big Three competition. (See table.) Nash and Hudson have produced only a handful of cars each in the past few months. Packard has ceased its production of 1953's and won't be in production until 1954 models start. Kaiser and Willys, now merged into one corporate unit, have had serious troubles, particularly at Willow Run where Kaiser hasn't produced a car in months.

Studebaker, probably strongest of the independents, has shown good production gains, but is still running behind its 1952 percentage of the market. Only recently Studebaker announced cutbacks to ease dealer inventory problems and to avoid a serious cleanup problem at the close of the model year.

Evaluating the automotive picture in terms of market percentage is probably the best way of showing the relative strength of the field.

Gain but Lose

For example, in 1952, when production was under controls for most of the year and a steel strike contributed a comparatively low auto production, all independents produced a total of 347,190 passenger cars in the first 8 months of the year. This represented 13.9 pct of total production.

In the first 8 months of 1953, with production uncontrolled, independents produced 432,186 cars, but still dropped to 9.89 pct of the total. Only one independent, Packard, showed a percentage gain. Packard, at the end of 8 months, had increased its share from 1.49 pct to 1.64 pct. However, Stude-

	1953		1952	
MANUFACTURER	PRODUCTION 8 MONTHS	PCT OF TOTAL	PRODUCTION 8 MONTHS	PCT OF TOTAL
HUDSON	57,488	1.32	54,231	2.09
KAISER	19,900	0.46	44,280	1.71
NASH	107,343	2.45	84,305	3.25
PACKARD	71,553	1.64	38,579	1.49
STUDEBAKER	141,242	3.23	96,759	3.73
WILLYS	34,660	0.79	29,036	1.12

SOURCE: WARD'S AUTOMOTIVE REPORTS

baker showed the greatest gains from 96,759 cars to 141,242 for the same period this year, but dropped from 3.73 pct of the total to 3.23 pct.

Who got the increases? GM, led by nearly a 4 pct increase in Chevrolet, jumped from 42.71 pct to 47.19 pct of the total. Ford divisions gained from 21.88 pct to 22.53 pct. Chrysler Corp. dropped slightly in terms of production percentage to 20.39 pct.

Rely on Suppliers

The problems confronting an independent are terrific. They do not have the vast engineering, manufacturing, purchasing, research, industrial relations, or even public relations facilities of their larger competitors.

It is frequently too much of a job for them to design and manufacture many of the new technical developments that are being brought out each year. In many cases they have to go to an outside supplier for their automatic transmissions, power steering, or power brakes.

Many of them do not make their own bodies and feel they are at the mercy of the body manufacturer which may have larger customers to serve.

That is why Mr. Mason's comment on interchangeability of parts may be significant. It could save on tooling costs, spread engineering expenses, and by larger production encourage automation and mass production methods that are generally lagging among the independents.

Less Government Building

Statistics compiled by the Bureau of Labor Statistics show that government construction contracts through June 30 totaled $1.5 billion, as compared with $2.2 billion last year.

Value of contracts for industrial types of construction were 25 pct below those awarded for first half 1952, in spite of the boost given by a $50 million second quarter award for building atomic energy facilities in Tennessee.

TRAILERS: Ride Rails Two by Two

Electro-Motive Div. shows flat car to carry two trailers . . . Double capacity will aid coordinated shipment growth . . . GM will build or license its car design—By W. G. *Patton.*

The railroads and the truckers may get together after all. Plans to provide a coordinated fast freight service got a substantial shot in the arm last week when GM's Electro-Motive Div. unveiled a new type flat car especially designed to carry two truck semi-trailers.

For the past 2 years Electro-Motive has been conducting an intensive experiment looking toward solving the mechanical problems involved in moving highway semi-trailers by rail. The proposal to move road trailers by rail is not new. However, GM's special flat car carries two trailers instead of one. This makes the proposal attractive to the railroads from a revenue viewpoint. Truckers are also interested since the plan would take trailers off crowded highways, at the same time, yield a satisfactory financial return.

Has Tax Write-off

Strongly interested in the new cars, and at present the most logical choice as first customer is Rail Trailer Co. of Chicago. Rail Trailer, together with its operating subsidiary, Van-Car Corp., has been developing a truck-rail program for some time (THE IRON AGE, Mar. 19, 1953, p. 82).

Rail Trailer holds two certificates of necessity totaling $28 million covering purchase of such cars, with Electro-Motive named as builder. Under the proposed plan, Rail Trailer would own the cars, lease them to the railroads. No orders have been placed yet, but the program is ready to go, says N. C. Dezendorf, Electro-Motive general manager.

To handle the service, Electro-Motive engineers have designed a well-type railroad car 75 ft long. The car is equipped with roller bearing, high speed, freight trucks. A stanchion, embodying a fifth-wheel arrangement is installed at each end of the car. A rubber shock absorber mounted in the stanchion permits longitudinal movement of 4½ in. in each direction.

A special hydraulic lift truck, built by Clark Equipment Co., engages the towing plate of a semi-trailer and maneuvers the trailer aboard the rail car. The comparatively high center "backbone" of the trailer car facilitates loading and also minimizes side sway in transit.

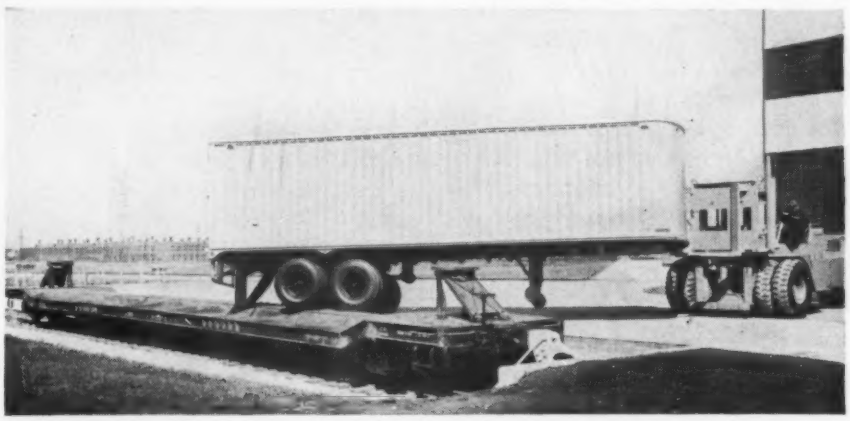
Electro-Motive has proposed construction of special terminals at the edge of metropolitan areas to assure fast makeup of trains. These terminals, bypassing main freight classifications, have either depressed tracks or elevated platforms. Cost of the terminals may range from $250,000 to a million dollars, depending upon capacity. In the absence of such special terminals, Rail Trailer is prepared to handle the service at regular railheads.

Using the Electro-Motive cars and special lift trucks, and loading from both sides, a 100-car train can be loaded in an hour.

It is estimated that the railroad's overall freight traffic has increased only 3.6 pct compared with 1946 despite a $6½ billion investment in facilities. Less-than-carload shipments have declined steadily. Motor carriers, on the other hand, have found it increasingly difficult to operate long inter-city hauls at a profit.

Achievement of a better balance in rail and highway utilization is the ultimate aim of the Electro-Motive program. Electro-Motive will either license other firms to build the special cars or undertake a building program itself at its Cleveland plant.

Adoption of the plan would introduce a new chapter in American railroading, in which the railroads, trucks, the motoring public and taxpayers would all be beneficiaries, Electro-Motive officials believe. The U. S. Interstate Commerce Commission has encouraged full discussion of the plan.



SPECIAL Clark Equipment Co. lift truck maneuvers semi-trailer on GM's Trailer Transport Car, designed to carry two trailers per car on intercity rail hauls.

The Rail Highway Coordination program proposes that special, non-stop freight trains be made up daily, say in Pittsburgh or New York, for delivery to Chicago. Delivery time as well as cost per mile to rail or truck carriers would be reduced substantially.

Estimates by Electro-Motive engineers place the cost of the new service at 20¢ per trailer-mile. Railroads would receive 40¢ per car-mile. Cost of the special two-trailer car is about $14,000. Cost of fork lift trucks is estimated at $10,000 to $12,000 initially.

LABOR: Curing Chronic Relations Ills

Case history of an employee communications program . . . Used to improve labor-management relations . . . How it operates, what it accomplished—*By E. C. Kellogg.*

Steel Improvement & Forge Co. had a history of chronic labor sickness. Four times between 1936 and 1946 major strikes forced the Cleveland firm to shut its gates. Departmental work stoppages were frequent, and labor-management hostility was so intense that workers often walked off the job first, negotiated later.

Less Labor Trouble

Climax came in the fall of 1946 when the workers were out for 5 weeks. Steel Improvement President Charles Smith, Jr., knew labor-management relations would have to be improved if his firm was to stay in business.

As a result an employee communications program was started. The plan was so successful that Steel Improvement has been carrying it out vigorously ever since. U. S. Chamber of Commerce recently released a booklet on the program.

Benefits of the program are difficult to list because so many of them are intangible. But Mr. Smith states that his firm has had less labor trouble since 1947 than at any other time in the past 20 years. Employees are much more cooperative, he says, and despite the addition of many untrained workers in the last few years, Workmen's Compensation premiums have been cut in half.

To start the program a consulting group was hired to find out how well all phases of management, from president to foremen, understood company policy and fundamental business economics. Results showed that while top management was reasonably well informed, foremen knew little about either company policy or economics.

The void of information pointed up by the survey prompted a four-part communications program consisting of an employee newsletter, written by the president, an employee handbook, a series of supervisory dinner meetings and a cartoon booklet.

Main purpose of the program has changed several times since the plan was started. At the beginning, the most important job was to give workers basic information about the company. When this phase was completed the accent shifted to special problems such as improving customer service, the why of pricing.

Most important part of the employee communications plan is the president's newsletter which is mailed to the workers' homes about every 6 weeks.

Its purpose is to keep employees informed on overall business conditions, the company's success or failure in getting certain orders.

Other newsletter topics: analysis of Steel Improvement's competition, the function of stockholders, reasons for increasing or cutting the number of employees.

Success of the letter is indicated by a survey which showed that more than 90 pct of the workers read it.

Purpose of the employee handbook is to explain the benefits and treatment employees may expect from the company and in turn what the company expects from the workers. One unlooked for benefit that resulted from preparing the handbook was that it forced the company to establish a definite employee relations policy.

Very early in the program it was discovered that most of the workers had no conception of how their jobs fitted into the company's overall operations and knew even less about other departments.

Typical of the kind of misunderstanding that existed was the hammerman who complained that Steel Improvement was making exorbitant profits. He had just learned that the company charged 30¢ for a forging which he was producing at a 2¢ per piece rate. He assumed the company pocketed 28¢ profit on each forging.

To clear this up a cartoon book was published which showed all the operations that are involved in producing a forging—from advertising through final billing.

Discuss Economics

To give members of the management group a better business background, a series of dinners have been held regularly.

The meeting usually begins with a discussion of fundamental economics and how they affect the company. A copy of the U. S. Chamber of Commerce's monthly *Economic Intelligence* is distributed to get the discussion going.

Then one of the company officers explains the functions of various departments, their problems and plans.

Proof that efforts to educate supervisors have been worthwhile is the fact that in an Opinion Research Corp. quiz, Steel Improvement supervisors scored 77.9, considerably higher than the 61.5 national average for similar groups.

ECONOMICS EDUCATION CHANGES WORKER ATTITUDES

What workers at Steel Improved & Forge Co. believed before and after a short course in basic economics.

	Before pct	After pct
Companies seek profits by lowering prices, not by keeping them high.	71	87
Companies grow through service, not from unfair use of economic power.	51	64
Machines have done most to raise the standard of living.	41	55
Best way for workers to increase their standard of living is to produce more.	51	64
Industrial growth depends on saving money and investing it.	51	68
Government is not responsible for seeing that everyone has a job.	14	32

Blow Concrete to Shore Up Mine Tunnels

Mixing, compressed air piping all done underground.

Speedier, easier delivery of mixed concrete is made possible in International Nickel Co.'s Creighton Mine by preparing it in the mine and then blowing it by compressed air to wherever it's needed.

Many shafts, tunnels and other openings—some abandoned before World War I—are again being utilized in the speedup of nickel mining operations. Timber supports have rotted away in many cases and extensive concreting is needed.

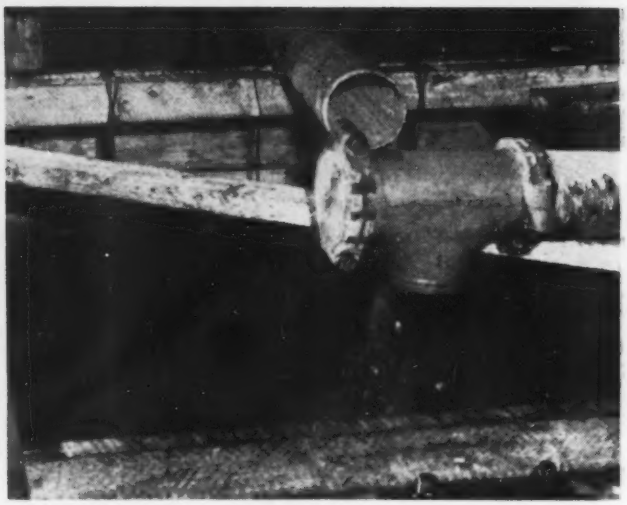
Gravel is gravity-fed to mixing stations on the sixth and twentieth levels through an old raise. Cement is brought in by the regular transportation system. Mixed concrete is delivered through 6-in. steel pipe with 8-in. NiHard lined pipe on long curves.

Best uphill performance so far was 1315 ft with a rise of 260 ft. Record on a down grade is 1670 ft.

TURNING ON compressed air to force concrete through 6-in. pipes.

WALLS AND ROOF of this slusher drift are both concreted to provide safety. Broken ore from caved area passes down through boxholes in side of drift and is slushed, or scraped, into ore pass leading to underground crusher. Monthly use of cement in mine runs to thousands of bags.

POURING concrete from mixer into long, cylindrical placer. Concrete will be blown to building forms.



DESTINATION is form for slusher hoist base. "T" reduces abrasion from concrete at right-angle bend.

ECONOMY: How to

AIC delegates foresee no recession—if businessmen stay on their toes.

No recession, a long range plan for foreign trade, sensible pension planning and more scientific methods for compensating executives. These topics kept delegates to Cleveland's Associated Industries fall conference busy.

Almost to a man the midwestern executives agreed there wouldn't be any serious recession following Korea if businessmen stayed on their toes and refused to talk themselves into a hole.

Mr. Charles R. Sligh, Jr., president of the National Assn. of Manufacturers, sounded the keynote when he told guests and delegates he saw "no basic economic reason" for pessimism. Mr. Sligh, who admitted he was serving as an informal sounding board for President Eisenhower on his travels, said he found the recession topic at fever pitch throughout the country.

The NAM chief didn't confine his optimism to the somewhat vague area of psychological reaction. Instead he pointed out that gross national product, disposable income and hourly wages were still perched at alltime highs. He emphatically stated that these conditions could be maintained if most executives would "revitalize your interpretation of the free enterprise system."

Cites Mechanization

Optimism about the future in the "new broom" era was also expressed by at least one representative of Detroit's automaking center. Ray Sullivan, vice-president of the Ford Motor Co., predicted better things through automation. Mr. Sullivan said he felt the marvel of completely mechanized production would create more jobs instead of throwing men out of work.

Delegates and guest speakers didn't overlook the vital question of foreign trade. Although none seemed anxious to compete with

Foil Recession

American tax dollars, most were in favor of a "trade, not aid" program. Only reservation barring unanimous support was the belief that a sensible long range program would first have to be mapped out.

Delegates who formed earnest discussion groups during conference breaks frankly said they thought complete abolition of tariffs would be as disastrous to Europe as it would be to the U. S. However, they generally echoed the sentiments of Mr. Sligh by expressing willingness to compete with foreign goods on a fair basis. In this respect many thought it would be impossible to establish healthy relations with Western Europe until Europeans themselves could break down the economic isolation which presently handcuffs intra-European trade.

Europe's Problems

If any capsulized solution emerged from the Cleveland meeting it would have to include gradual tariff reduction; reconsideration of quotas and regulations and elimination of self-defeating customs procedures which have caused so much trouble in Europe. This solution, of course, would have to be predicated on the hope that Europeans would pitch into a renewed study of productivity, merchandising and other sales problems which have to be licked.

With many labor groups poised to make new demands, pensions also got their fair share of attention at the gathering. Participants protesting against welfare thinking and lack of controls generally took the stump for pension plans established on a firm basis of actuarial soundness and ability to pay. Many decried present practices which encourage union-supervised non-contributory plans.

These men claimed labor and management would have to find agreement on contributory systems jointly supervised and adequately financed. Periodic revisions in the light of changing developments were also urged.

AIR POLLUTION: More Laws Coming

Several cities and states are tightening zoning and air pollution laws . . . Average householder also an offender . . . Need more information . . . Costs lower—By K. W. Bennett.

If the smog is solid and gray over your city, don't blame that foundry down the block. With air pollution drawing increasing attention, a growing number of smoke watchers point out that the average householder is as much an air polluter as industry. A number say that he's far worse.

Despite sterling efforts at pollution abatement, industry has increasingly been under fire as a smog maker. There are indications that the fire will get hotter in the near future.

Chicago is considering a zoning requirement that will include air pollution as one of nine major nuisances. The small metalworking shop, foundry or smelter, or even a heat treater, could be affected. They could be zoned out of an area where only heavy and intermediate industries were previously forbidden.

West Virginia, Nevada, and New York have begun air pollution control measures in the past year, as well as a number of cities. The Chicago ordinance is expected to be followed by some other midwestern cities.

Skies Are Cleaner

Anti-air-pollution efforts by industry have been honest and effective. The foundry industry, for instance, has poured 10 pct of all its capital investments into air pollution controls in recent years. In Chicago total dust fall has dropped 15 pct since 1943 and the combustible content of this dust has fallen 50 pct.

The Chicago citizen had 10,000 lb of sky-borne dust dumped on his city block in 1926, had to cope with only 3000 lb per block by 1934, and was getting only 1700 lb per block by 1948.

If Chicago is representative, however, the record to 1948 doesn't tell the entire story. In that year, this single city appeared to hit the law of diminishing returns, and figures from 1948 to 1952 indicate that the amount of dust and combustible materials in the air began to level off and hasn't shown much improvement. In 1951 the dust figure actually rose.

A good share of the trouble begins at home. Improperly fired furnaces in homes and apartment buildings and overage equipment are heavy smoke producers—probably far worse than industrial output. The improperly used home incinerator that merely singes, doesn't burn, the garbage is another pollution producer.

Where Problems Lie

Accepting this, the fact remains that industry will be an early recipient of any pollution control programs. A city smoke inspector was asked what industries had the most difficult pollution abatement problems in his area. He listed smelters and foundries, chemical industries, paint and varnish producers, wood products producers where scrap wood is part of the fuel charge used in the company furnaces, and brick kilns in that order.

An industrial engineer led off his list with steel mills, though he admitted that these are usually too far from metropolitan areas to affect them directly. Results of these evaluations can be expensive to the factory owner. A woodworking plant that formerly burned scrap in its own boiler plant, must now haul away as much as five loads of combustible wood scrap daily. Inspections can be expected to grow more stringent.

"What does that screwball want?"

Costs Coming Down

Equipment to reduce air pollution has been making rapid strides. Design and operating techniques have been advancing yearly. Collectors, wetwashers, venturi scrubbers, cyclones, and backhouses have been designed for increased life and effectiveness. Catalyst techniques and electrostatic precipitators have shown considerable promise.

The electrostatic device was initially a high cost installation, most metalworking men believed. One industrial engineer indicated that he once found it usable only where the client burned 20 tons of coal or more per day. He has since completed installations where half that tonnage is burned daily and they proved economic. With smaller package units now available, he believes the cost will decrease further.

Step Up Studies

A study will begin shortly under the auspices of the Midwestern Air Pollution Prevention Assn. to analyze the content of airborne dust and fumes. Who makes it, who makes the most, and why? And the Midwest will get an education program on what research programs are learning, what's known about air pollution to date, what's to be done about it.

In the meantime, civic smoke hunters say a lot of their troubles could be cured by (1) eliminating obsolete combustion equipment, or repairing and cleaning existing equipment; (2) thorough training of furnace operators in firing and cleaning their fires, or addition of automatic controls to hand-fired industrial operations; and (3) more data on what makes up air pollution and who produces it.

ARMS: Industry Aids Improvement

Private firms to get about 60 pct of Defense Dept.'s weapons research funds . . . Management know-how vital . . . Wilson denies slighting basic research—By *R. M. Stroupe.*

Private industry's share in government funds for research on new military weapons and equipment may be as much as $750 million or more this fiscal year.

This is inferred from an "educated guess" made last week by Donald A. Quarles, Assistant Defense Secretary for Research & Development (R&D). There is no fixed apportionment scheme which guarantees industry a given percentage share of R&D money. But Mr. Quarles doesn't expect much change from fiscal '53 level of 60 pct of total funds for research by private companies.

Total military research expenditures this year will be about $1.3 billion. Sixty pct of this figure would be about $780 million for commercial firms. Grants to nonprofit institutions may amount to 10 pct of the $1.3 billion.

Private Research Valuable

Military spending for R&D is now at an annual rate 2½ times that for any year in the 1947-50 period. Out of its investment, Defense Dept. is paying for 8000 separate research projects.

Past experience has shown Pentagon officials the value of calling on civilian firms for a vital contribution to military research. Two important factors favoring the private contractor in this work are:

1. Industrial management experience, which can provide the most research for the military dollar. Defense Secretary Wilson, in particular, says he wants to prevent excessive spending of research funds for administrative overhead.

2. Continuity of operational control, not always possible in projects handled exclusively by federal agencies.

Mr. Wilson takes issue with the criticism, offered in some quarters earlier this year, that his department is giving a cold shoulder to basic research. Last week, appearing with Mr. Quarles for a discussion of R&D activities, he announced an intention to "support basic research this coming year at substantially the same levels as we are now doing."

In dollar figures, the estimate is that this support will require more than $25 million. This is about the size of Defense Dept. outlays for basic research jobs by universities and non-profit laboratories in fiscal 1953.

Optimistic on Air Security

Close cooperation between the military establishment and National Science Foundation, especially on basic research matters, is expected by Mr. Wilson. He says his department has been able to pare down its backing of projects in the "more theoretical" sciences because of NSF support for this work.

Mr. Wilson will ask Congress for money to improve U. S. security from aerial attack, but he isn't planning to seek a multi-billion-dollar sum for this purpose. He believes perhaps $500 million in additional funds will be needed for radar warning equipment and counter-weapons to prevent hostile air strikes.

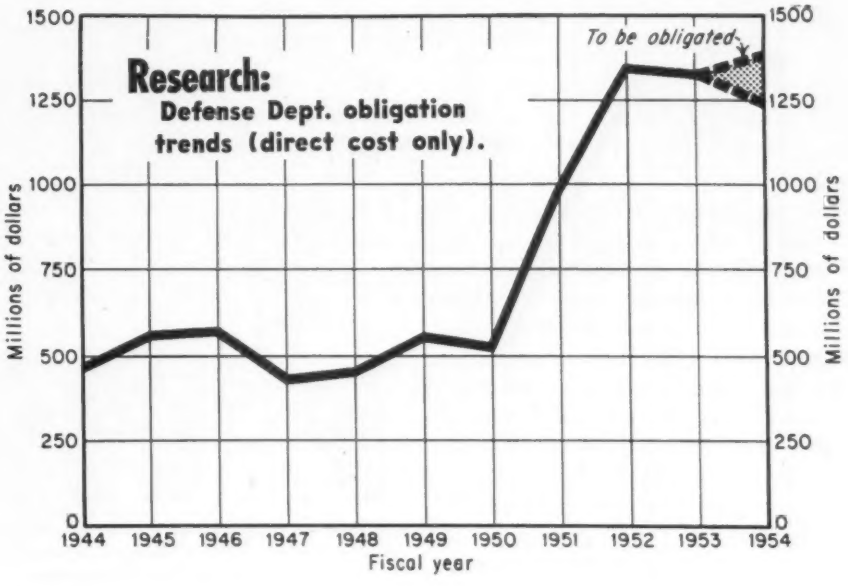
He feels that a fair state of preparedness exists right now and that the U. S. is in a comparatively strong military position. Rather than rely on existing defense measures, however, the blueprinters are known to be working closely with Canada on the proposed "McGill fence."

Watch Funds Closely

(This electronic alarm system, developed at McGill Univ., Montreal, has been described by some military men as a suitable "interim" screen, capable of alerting air defense units. Reports indicate it would not track planes passing over or show in what direction they are moving.)

In the field of budgetary—not aerial—preparedness, Mr. Wilson now demands a "tight and effective" control over progress payments to defense contractors. Discussing his recent directive ordering such control, he said last week that good business practice demands a closer watch on payments, which are of two general types.

One, used chiefly on shipbuilding and heavy construction con-



tracts, is based on the amount or percentage of work completed. The other, found most often in connection with aircraft orders, is tied to the contractor's expenses while the job is underway.

According to Mr. Wilson, some contractors had become "a little sloppy" in inventory management when defense funds were involved. He said some overpayments had resulted because of this situation.

Maximum amount involved in these overpayments, he suggested, was perhaps "$200 million or $300 million."

Machine Tools:

To store government tools as production unit packages.

Federal agencies which put away their machine tools in keeping with the newly-announced "package storage" policy will be required to report periodically to Office of Defense Mobilization on the condition of the equipment.

Effective Oct. 9, the policy statement appeared in the form of Defense Mobilization Order VII-4. It was designed to insure that production gear, after being stored where it will be readily accessible when needed, will be maintained in usable form at all times.

Each " package" of government-owned machine tools will consist of a complete wrap-up of the equipment needed to turn out a military weapon or related item at a given plant. Equipment with a known defense-mobilization application is intended for storage in close proximity to those facilities which would put it into operation in times of crisis.

This type of storage is considered superior to central government warehousing, involving the danger of a break-up of "packages." Referring to the possibility that some central storage may be inevitable, the policy order cautions that "all efforts should be exerted to maintain intact complete complements of production equipment."

In general, government - owned tools are not to be leased to non-defense producers. Variations are provided, however, as in the case of equipment carrying the Defense Dept. tag. If the military establishment has plans for leasing this equipment to a non-supplier of defense goods, it will submit its plans to ODM for approval.

Approval, according to ODM director Arthur Flemming, will be given only in "extraordinary cases" where it is undeniably to the nation's interest that the tools be fitted into civilian production. Mr. Flemming expects to ask Commerce Dept. and Small Business Administration for their advice before okaying this type of leasing.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Bearing assy, V, $194,701, Lucian Q. Moffitt, Inc, Akron, Ohio.

Valves, gate, V, $67,060, Walworth Co., New York

Aeronautical storage battery, V, $62,738, Gould-National Batteries, Inc., Depew, N. Y.

Maintenance parts for aircraft, V, $119,-609, Douglas Aircraft Co., Inc., Santa Monica, Calif., *N. H. Shappell.*

Assemblies for V, aircraft, 1021 ea, $80,218, Lord Mfg. Co., Erie, Pa.

Maintenance part for engine, V, $361,-808, Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y., *A. W. Dietrick.*

Maintenance parts for aircraft, V, $63,-750, North American Aviation, Inc., Columbus Div., Columbus, Ohio, *C. E. Bloomer.*

Motor amplifier assy, V, $130,454, Engineering & Research Corp., Riverdale, Md.

Container, metal for nose bomb fuze and tail bomb fuzes, V, 239000, $43,302, Continental Can Co., Inc., N. Y., *J. B. Jack.*

Special tools & ground handling equip, $650,000, Westinghouse Electric Corp., Washington, D. C.

Assemblies, switchgear, 4, $157,088, General Electric Co., Philadelphia.

Cores, 50,000 ea, $123,550, Waterbury Co., Inc., Waterbury, Conn.

Jig, positioning for tool kit, rocket modification, 236 ea, $65,669, Service Machine Co., Elizabeth, N. J.

Replenishment of combat vehicle parts, 8500, $730,660, Continental Motors Corp., Muskegon, Mich.

Cable assy, 312, $122,460, Joy Mfg. Co., Electrical Connector Div., St. Louis.

Equipt, plate loading, 3, $147,759, Acme Aluminum Alloys, Inc., Dayton.

Intervalometer, camera, 838 ea, $275,869, Bill Jack Scientific Instrument Co., Solana Beach, Calif.

Generator and spares, 649 ea, $331,857, Jack & Heintz, Inc., Cleveland, Ohio, *P. J. Barensfeld.*

Airplanes, 2 ea, $3,019,132, Consolidated Vultee Aircraft Corp., Fort Worth, Texas.

Aircraft engine spare parts, $2,141,790, Wright Aeronautical Division Curtiss-Wright Corp., Wood-Ridge, N. J.

Miscellaneous assys for aircraft, $318,-815, Beech Aircraft Corp. Wichita, Kansas, J. F. Allen.

Airblast room cleaning equipt, 2, $88,537, American Wheelabrator & Equipt. Corp., Mishawaka, Ind.

Trailers, medical surgical, 8, $83,671, Boyertown Auto Body Works, Inc., Boyertown, Pa.

Die chasers, die heads, running, $50,-000, Geometric Tool Co., Electronics Div., Syracuse.

Germanium diodes, 30000 ea, $55,500, General Electric Co., Electronics Div., Syracuse, N. Y., *W. D. Maroney.*

Reflectors & tooling, 2000 ea, $158,350, Daco Machine & Tool Co., Brooklyn.

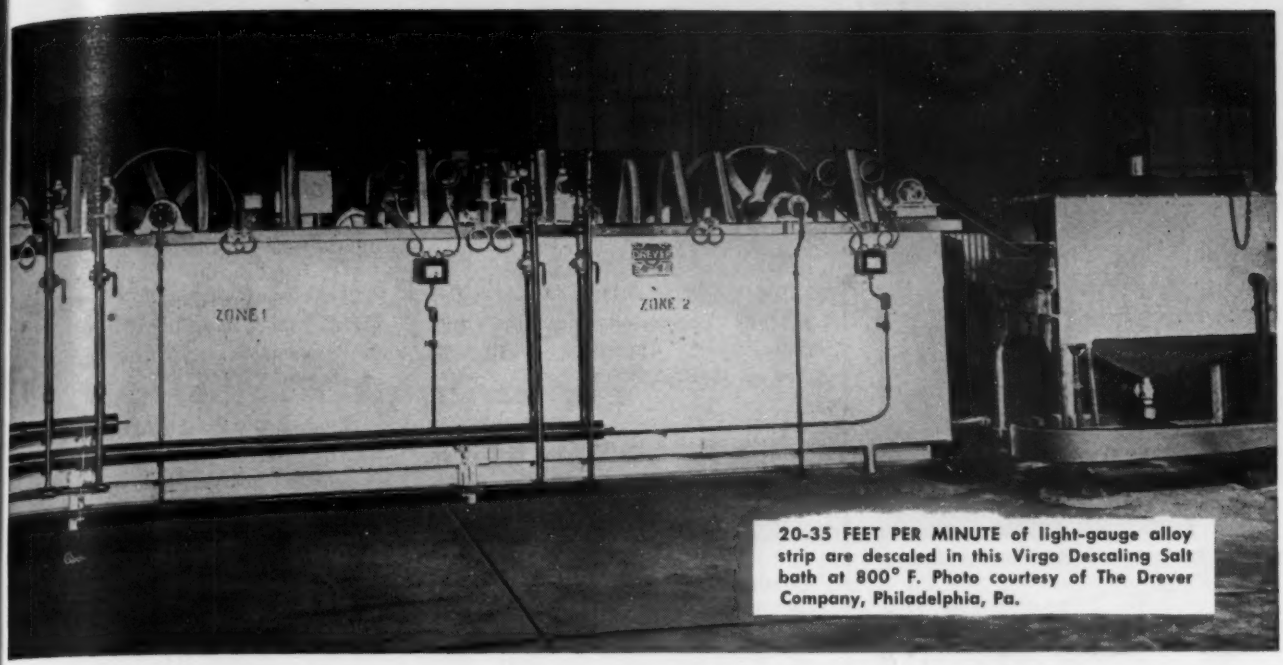
IRON, STEEL: August Output By Districts

As Reported to the American Iron and Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Annual Capacity	PIG IRON August	PIG IRON Year to Date	FERROMANG., SPIEGEL & SILVERY IRON August	FERROMANG., SPIEGEL & SILVERY IRON Year to Date	TOTAL August	TOTAL Year to Date	Pct of Capacity August	Pct of Capacity Year to Date
Eastern	16,312,990	1,273,250	9,838,039	33,507	227,657	1,306,757	10,065,696	94.3	92.7
Pitts.-Yngstn.	28,643,120	2,309,048	18,381,538	34,178	276,599	2,343,226	18,658,137	96.3	97.8
Cleve.-Detroit	8,633,800	733,582	5,679,456	.....	.....	733,582	5,679,456	100.0	98.8
Chicago	16,251,250	1,331,731	10,486,195	.....	9,399	1,331,731	10,495,594	96.4	97.0
Southern	6,020,380	423,751	3,732,563	12,120	64,938	435,871	3,797,501	85.2	94.7
Western	3,518,700	320,387	2,605,206	.....	.....	320,387	2,605,206	107.2	111.2
TOTAL	79,380,240	6,391,749	50,722,997	79,805	578,593	6,471,554	51,301,590	98.0	97.1

STEEL —NET TONS DISTRICTS	Annual Capacity	TOTAL STEEL* August	TOTAL STEEL* Year to Date	TOTAL STEEL* Pct of Capacity August	TOTAL STEEL* Pct of Capacity Year to Date	ALLOY STEEL August	ALLOY STEEL Year to Date	HOT TOPPED CARBON INGOTS August	HOT TOPPED CARBON INGOTS Year to Date
Eastern	23,863,810	1,918,791	15,344,089	94.6	96.6	145,228	1,301,792	352,612	3,059,707
Pitts.-Yngstn.	43,621,000	3,427,352	28,545,690	92.5	98.3	513,039	4,381,237	441,527	3,634,140
Cleve.-Detroit	12,002,900	981,585	7,632,311	96.3	95.5	84,226	662,501	83,063	702,319
Chicago	24,960,600	2,043,992	16,597,126	96.4	99.9	138,961	1,205,935	334,537	2,581,266
Southern	6,036,160	490,271	3,857,626	95.6	96.0	4,999	39,877	6,964	41,840
Western	7,063,000	543,589	4,650,347	90.6	98.9	4,859	98,051	30,308	215,040
TOTAL	117,547,470	9,405,580	76,627,189	94.2	97.9	891,312	7,669,393	1,249,031	10,234,312

* Includes Alloy Steel, Hot Topped Carbon Ingots.



20-35 FEET PER MINUTE of light-gauge alloy strip are descaled in this Virgo Descaling Salt bath at 800° F. Photo courtesy of The Drever Company, Philadelphia, Pa.

HOW TO
DESCALE 5½ MILES OF STRIP PER DAY

You can get clean bright surface in ONE operation with VIRGO® DESCALING SALT

Straight chrome and chrome nickel strip flow through this continuous descaling-annealing unit, at 25-35 feet per minute—about 5½ miles per 24 hour day.

The light-gauge strip is descaled in one pass through a bath of molten Virgo Descaling Salt at 800° F., after annealing. The process yields a chemically clean, bright surface with no pitting, etching or metal loss.

Large or small, your plant can show real production-time savings with the Hooker Process using Virgo Descaling Salt, or with the Virgo Molten Cleaner process. Use these processes on stainless and alloy steels; castings; forgings; fabricated parts; material to be salvaged. Both processes are non-electrolytic . . . non-toxic . . . employ simple equipment . . . do not require close supervision . . . are easily adapted to your production methods. For full details, mail coupon or write us today.

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VIRGO® MOLTEN CLEANER—Quickly, positively desands and degraphitizes castings; removes grease, dirt, chemicals, paint, enamel, rubber atmospheric corrosion and other impurities.

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1-1445

Industrial Briefs

Steel Warehouse . . . JONES & LAUGHLIN STEEL CORP., Pittsburgh, will open a new steel warehouse in Louisville early next month.

Buys Land . . . UNIVERSAL-CYCLOPS STEEL CORP., Bridgeville, Pa., has purchased the land and buildings of Vanadium Corp. of America at Bridgeville.

Resumes Tours . . . TENNESSEE COAL & IRON DIV., U. S. Steel Corp., has resumed its weekly plant tours at its Fairfield Steel Works, Birmingham.

Coming Up . . . PURCHASING AGENTS' ASSN. OF BALTIMORE, INC., will sponsor the Eleventh Annual Manufacturers' Products Exhibit which will be held on Nov. 3-5 at the Emerson Hotel in Baltimore.

New Dealer . . . CLARK EQUIPMENT CO., Buchanan, Mich., has appointed Crunkleton Co., Charleston, W. Va., as a distributor.

Forms Division . . . ATLAS MINERAL PRODUCTS CO. has formed Thermoplastic Structures Div. as part of its program of expansion in the extrusion of pipe and the fabrication of plastic structures.

Re-Elected . . . INDUSTRIAL MINERAL FIBER INSTITUTE, INC. has re-elected Frank Christenson, of Refractory & Insulation Corp., New York, its president and chairman of the board.

Ground Broken . . . TRAILMOBILE INC. recently broke ground for its new $350,000 division headquarters in Omaha.

Granted Leave . . . INLAND STEEL CO. has granted a 6-months' leave of absence to Kenneth J. Burns, manager of sheet and strip sales, to serve with National Production Authority in Washington as deputy director and later as director of the Iron & Steel Div.

Expanding . . . MINNESOTA MINING & MANUFACTURING CO., St. Paul, plans a $1,500,000 expansion of its roofing granule manufacturing facilities at Wausau, Wisc.

Magnet Center . . . Carboloy Dept., GENERAL ELECTRIC CO., Detroit, will open its new magnet plant in Edmore, Mich., this month.

Transfers Assets . . . The Buda Co., Harvey, Ill., will complete the transfer of its assets to ALLIS-CHALMERS MFG. CO., Milwaukee, by the end of this month.

Mexican Company . . . KNAPP MILLS INC. has formed Knapp Mills de Mexico, S. A. with headquarters in Mexico City.

Oklahoma Rep . . . ADAMAS CARBIDE CORP., Harrison, N. J., has appointed Sooner Industrial Supply Co., Tulsa, as its sales representative for Oklahoma.

West Coast Office . . . RELIANCE ELECTRIC & ENGINEERING CO., Cleveland, in expanding its engineering and technical service on the West Coast will establish a direct factory sales office in San Francisco.

Joint Announcement . . . Thompson Products, Inc., Cleveland, and Ramo-Wooldridge Corp., Los Angeles, jointly announced the formation of RAMO-WOOLDRIDGE CORP. as an electronics and guided missiles research, development and manufacturing concern.

Gets Contract . . . RALSTON STEEL CORP., Chicago, was awarded one of the largest contracts ever let to supply steel for ventilating construction by the Atomic Energy Commission.

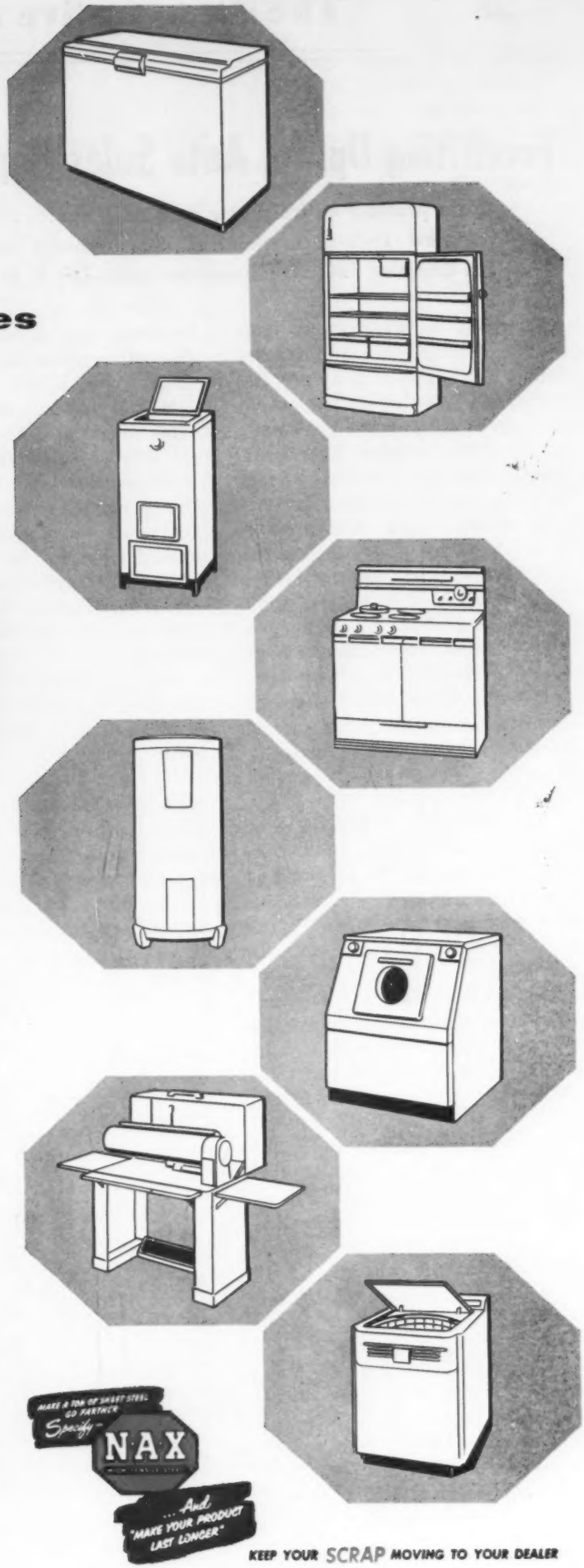
Will Erect . . . LURIA ENGINEERING CO., Bethlehem, has been awarded a contract to produce the new incombustible manufacturing and storage structures for erection at John Brennan & Co., Cicero, Ill.

In agreement . . . An agreement for the purchase of up to $15 million of first leasehold mortgage bonds has been negotiated between PRESQUE ISLE CORP., issuers of the bonds, and a large eastern insurance company. Money will be used to finance the construction of facilities for the quarrying and processing of limestone for metallurgical and other use.

Work Saving Week . . . Factories all over the country are urged to start plans now for a local Work Saving Week campaign to coincide with the national drive. The week WORK SAVING INTERNATIONAL, Silver Spring, Md., has designated is Nov. 16-20.

for **High Strength and Longer Life in Household Appliances Specify**

N-A-X
HIGH-TENSILE STEEL



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products, yet with greater resistance to denting. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, less surface preparation is required for either painted or plated parts.

Your product can be made lighter, resulting in shipping economies to consumer . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

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MAKE A TON OF SHEET STEEL GO FARTHER Specify NAX ... And "MAKE YOUR PRODUCT LAST LONGER"

KEEP YOUR SCRAP MOVING TO YOUR DEALER

Facelifting Uplifts Auto Sales Hopes

Costs prohibit entirely new cars each year . . . Automakers try new styling, mechanical improvements as sales lures . . . Chrysler lines stress smarter looks—By *R. D. Raddant.*

Everyone knows that an individual automobile manufacturer can't bring out an entirely new car each year. Cost of tooling, which can approach $100 million for a major manufacturer, plus engineering, and the multitude of factors entering into it, make a wholesale revision each year prohibitive.

But the manufacturer, even though he is tied to the same basic model, must make changes, revisions and improvements. Each year new models must be placed before the public as new cars with new features that will attract prospective customers to the showroom.

Just As Hard . . . This is what is called a facelifting. Automakers shun the term like the plague, but a successful one represents in its own way as much ingenuity as does the building of an entirely new car.

Typical examples of facelifting will be found on probably the majority of new cars this year. Those with new engines and completely new bodies will be in the minority.

Divisions of Chrysler Corp., all of which presented entirely new cars last year at a cost of more millions than anyone cared to disclose, are faced with the problem of presenting new cars without making basic changes. Let's see how they are doing it:

Change Disliked Features . . . To date, Dodge, which was introduced last week, and Plymouth, presented in showrooms Oct. 15, are available for inspection.

As in all intelligent model development, both divisions attempted to correct some of the features that customer research showed may have injured sales in 1953.

It is significant that both divisions lengthened their cars overall: 3⅝ in. in Plymouth models and as much as 5 in. for some Dodge models. Last year Dodge shortened its wheelbase for improved ride and maneuverability, but added length this year to increase the big car concept.

In both Dodge and Plymouth, wheelbase and interior size remained the same, but length was increased by new designs in bumpers, headlamps, tail lights and grilles.

Brighter Interiors . . . Both divisions made major improvements in interior styling, particularly with the use of colorful new fabrics which will be highly publicized. Dodge has contracted for all available mill capacity of a new fabric known as Jacquard, previously used in expensive upholstery and drapery.

Dodge also employs a new grain-type paint on the dash to reduce glare. New exterior colors of wider variety have been introduced in wholesale smartening up of appearance. Trim and brightwork were also varied.

"Just try telling my husband the gremlins dented his fender!"

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Oct. 10, 1953..	120,535*	25,944*
Oct. 3, 1953..	118,894	23,930
Oct. 11, 1952..	106,021	32,014
Oct. 4, 1952..	111,169	32,065

*Estimated: Source *Ward's Reports*

Following the trend started last year by Chevrolet, Dodge has an entirely new super deluxe line, the Royal, which was developed to lengthen the division's market scope. Plymouth's Belvedere is a comparable luxury model.

Add Mechanical Improvements . . . Facelifting years provide a good opportunity to introduce mechanical improvements and engineering developments. This year Dodge will have Powerflite transmission, which will give this division a fully automatic shift for the first time. The transmission is 100 lb lighter and has 100 fewer parts than the biggest competitive unit. Both divisions introduce power steering of the linkage type. Dodge increased its horsepower from 140 to 150.

This about covers the list of what is possible in facelifting. Very little was missed in these examples that was possible without more basic changes in body, chassis or engine. The rest is up to the salesmen.

Incidentally, last year Dodge set the price pattern for the industry when some reductions were announced at a time when increases were generally expected. For 1954 models prices will be held at the same levels as last year.

Production Not Enough . . . An automaker's job does not end at the assembly line's termination

where any story of auto production is generally closed.

A job still to be done is distribution of the hundreds of thousands of cars to distributors and dealers from coast to coast. Chrysler Corp., for example, moves some 800,000 cars and trucks a total distance of 600 million miles a year, before a driver gets his hands on the wheel.

Trucks Move Most . . . This job is taken over by traffic men at the end of assembly lines. They coordinate movement of auto output by train, truck, boat and barge. Most Chrysler division's assembly plants are located in Detroit, but others are at Evansville, Ind. and San Leandro, Calif.

Most cars are moved by truck with shipments originating from haulaway lots near assembly plants. Thirty carrier trucks can be loaded in 20 minutes with 120 passenger cars. On a normal day, some 2000 cars on 500 carrier trucks are dispatched from Chrysler assembly plants.

Teletype Driver Instructions . . . Dispatching the cars is a complex job. As new cars are completed, the traffic department compiles a running list of dealers who ordered them. This list is sent by teletype to haulaway dispatch offices and posted on a dispatch board.

Longest runs are handled by relays of drivers working 10-hour shifts at the wheel. Every 300 miles a new driver takes over at an auto carrier way station. A teletype network keeps the company traffic department alert to the movement of every car shipped. Warnings are flashed ahead in case of unusual weather developments and emergency measures such as filling radiators with anti-freeze can be taken as the situation warrants.

Cars transported by rail are moved in steel freight cars 10 ft longer than the average 40-ft boxcars. About 12 pct of the output of Chrysler divisions is carried to dealers by rail freight.

Sales:

Automakers estimate only 10 pct drop in 1954 market.

Automakers are placing their bets these days on what kind of a market to expect in 1954. With new models now coming out, production schedules must be set up on the basis of what kind of a sales response is expected.

Detroit estimates are still optimistic, generally anticipating a 10 pct drop in production from 1953, which will no doubt show the second highest production total in history.

See Third Top Year

An *Automotive News* survey of estimates by the manufacturers shows a difference of 650,000 passenger cars from the high estimate by General Motors and low by Ford.

GM is counting on a total output of 5,900,000 for the year. Ford's estimate is 5,250,000; Nash, 5,500,000; Packard, 5,300,000; and Kaiser-Willys, 5,350,000. The record production of passenger cars was 6,658,510 set in 1950. This year's estimated production of 6,150,000 will be the second alltime production year.

If a 10 pct drop is sustained, 1954 will still be the third top ranking year, which indicates the sound economic picture that automakers foresee in the next 12 to 15 months.

Auto Steel Freight Unabsorbed

Auto steel buyers, who read what steel executives say with the keenest possible interest, are wondering where all this talked-about freight absorption is.

A steel purchaser for one of the biggest producers said flatly last week that no major steel company had offered to absorb any freight costs to his plants. Nevertheless purchasing agents are boning up the old basing point system and intend to be prepared.

While there is absorption into this market of freight on galvanized, wire, seamless tubing, and a few other items, automotive steel is still out of the category.

THE BULL OF THE WOODS — **By J. R. Williams**

Labor Secretary is Middleground Choice

Selection of Mitchell won't please all labor or all management . . . Reuther offers handshake, asks Administration support . . . Debt's nearer the ceiling—By G. H. Baker.

President Eisenhower's choice of James P. Mitchell, career labor relations man, as Secretary of Labor last week filled the vacancy caused by the bolting of union boss Martin P. Durkin.

One important labor leader echoing the late Sen. Robert Taft called the appointment "incredible." Meantime, other union chiefs declined to comment immediately, indicating at least that choice of Mr. Mitchell was not outrageous. CIO president Walter P. Reuther offered the new secretary a handshake, promised to work with him but cautioned that Mr. Mitchell's effectiveness would be minimized unless he got Administration policy and budget support.

Middleground Choice . . . Mr. Mitchell, 52, was Assistant Secretary of the Army in Charge of Manpower, at the time of his appointment. During the war he was the War Dept.'s Director of Industrial Personnel. In addition to other important positions, he had been in charge of personnel at two large New York City department stores. Mr. Mitchell is well-respected by labor.

Some segments of business are not overly pleased by selection of Mr. Mitchell because of his "liberal attitude" towards unions. The appointment is regarded by Washington observers as a middleground choice calculated to soothe labor and obtain support of that part of management which believes in closer cooperation with unions.

"Stay Stingy" . . . Treasury Secretary Humphrey has cautioned all federal departments and bureaus to keep a still closer watch on spending. A major reason is that a delicate situation faces the Administration as the margin between the rising national debt and the legal ceiling narrows.

A refunding operation is forcing the Treasury to currently borrow up to $1.5 billion or $2 billion in additional money. This could leave the margin between the debt and the lawful ceiling as narrow as $500 million. Not a comfortable cushion, in federal eyes.

Mr. Humphrey still believes the government can get by until next January when revenue intakes generally rise a little. At least, he hasn't indicated publicly that he wants Congress recalled for another try at raising the debt limit above the set $275 billion.

Gay Time Expenses . . . Indications are Internal Revenue Service is giving closer scrutiny to deductions listed under business expenses. Congress may also focus on this when it gets around to overhauling the tax structure.

Revenue officials say there's nothing wrong with charging off entertainment expense for bona fide business. But they suspect "abuse." For instance, using a single client as the excuse for writing off cost of a large dinner is not highly regarded.

Complaints have been made to the House Ways & Means Committee, now ready to write up a report of a 2-year investigation.

Craft Union Push . . . Wanted: A sure-fire formula for deciding how far the National Labor Relations Board should go in preserving "freedom of choice" when it has to rule on whether craft unions should be permitted to set up bargaining units in plants traditionally organized on an industrial basis. (Opposing unions call it "raiding.")

NEW LABOR SECRETARY James P. Mitchell has been career labor relations man.

Such a decision faces NLRB in the case of a chemical company where craft units want to enter plants where bargaining has been on a factory-wide basis.

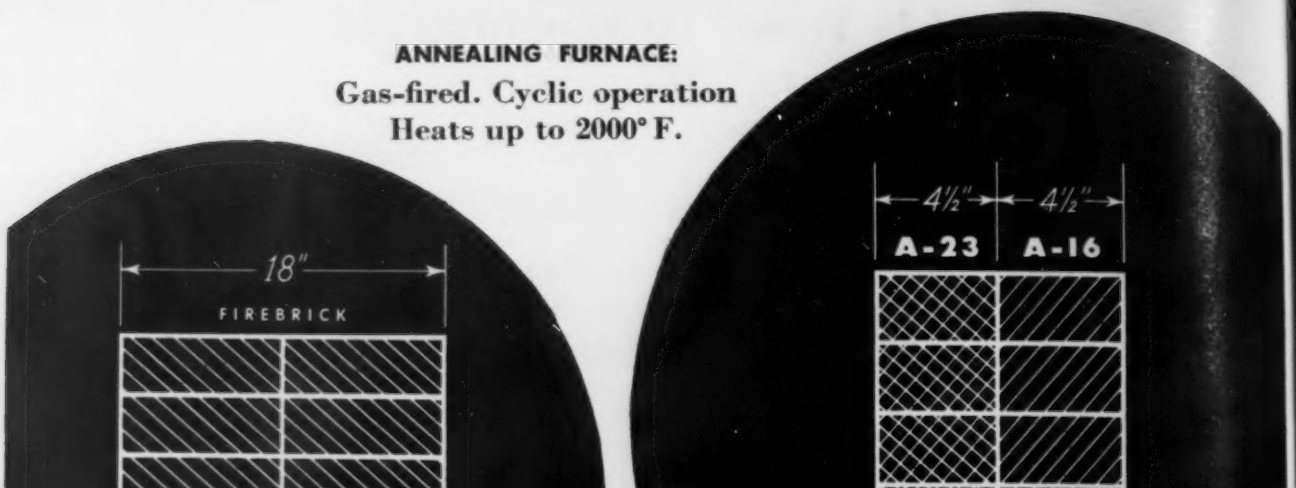
Prelude to Raiding? . . . Some spokesmen for industry say the board should give more weight to management wishes than in the past. Still others say that any union, whether craft or industrial, should be given preference if it has been recognized as the bargaining power for some time.

Much thought is being given the final decision, since it may indicate future policy. And at least one board member fears a decision for the craft units might "tend to stimulate" raiding.

Propose Pipeline . . . Petroleum Administration for Defense wants to stir up support for a new 940,000-bbl-per-day pipeline from Texas and the Midwest to the East Coast. PAD admits there is no oil industry resistance to the project, but hopes to sell the industry on the national defense angles of a huge new cross-country line.

A recent PAD survey of oil transport capacity discloses that

ANNEALING FURNACE:
Gas-fired. Cyclic operation
Heats up to 2000° F.



Which furnace wall construction results in less heat loss?

A simple change in the construction of this annealing furnace produced important savings in heat loss and fuel costs.

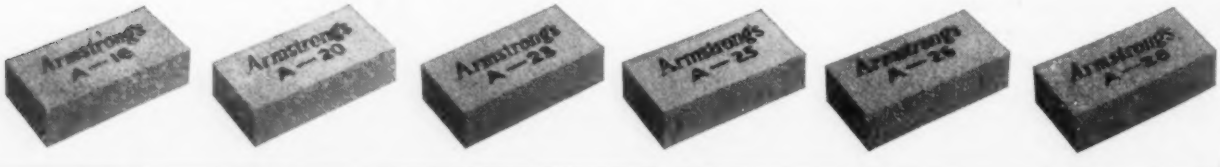
In the diagram on the left, 18" of regular fire brick form the furnace wall. With this construction, the heat loss through the walls was 772 Btu's per square foot per hour, while the heat storage built up to 51,929 Btu's per square foot of wall area.

See how the second design reduces this loss. 9" of Armstrong's Insulating Fire Brick—4½" of A-23 and 4½"of A-16—replace the 18" of regular fire brick. Heat loss through this wall now is only 339 Btu's per square foot per hour —a savings of about 56%.

There's an important reduction in heat storage, too. The low specific heat of the Armstrong's refractories in this second construction cut heat storage to 10,080 Btu's—a decrease of almost 80%! This results in valuable fuel savings, faster heating cycles, and increased production.

Do you have a furnace problem?

It's a good idea to call in your Armstrong engineer whenever you have a furnace lining or rebuilding job. His expert knowledge of furnace construction and brick performance can help you get top operating efficiency from your furnace. For his help, call your nearest Armstrong office or write today to Armstrong Cork Company, 2710 Susquehanna Street, Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

existing pipeline and tanker capacity would be inadequate to meet all essential needs in the event of war, according to Joseph A LaFourtune, deputy PAD administrator.

Long-range pipeline goal, as seen by PAD, is sufficient capacity to deliver 540,000 bbl of crude oil daily from Texas to the East Coast, and 400,000 bbl per day from the Midwest to the East Coast.

Atomic Energy:

Form more industry groups to study atom power plants.

While the controversy continues with respect to who has and who hasn't got a thermonuclear weapon, industry continues quietly to delve into the ways and means of making atomic energy work for nondestructive purposes.

Last week, new industrial teams prepared to take the field in the campaign to develop a commercially-practical nuclear reactor capable of turning out electric power.

Joining forces for this work are Duquesne Light Co., Pittsburgh, and Walter Kidde Nuclear Laboratories, Inc., Garden City, L. I. An agreement between the two for this purpose was approved last week by Atomic Energy Commission, which noted that five other teams had undertaken nuclear power studies under its industrial participation program.

Private Firms Share Cost

All costs incurred while the 1-year contract runs will be borne by the private companies. Participants will turn in a complete report of findings and recommendations to AEC.

Necessary approval also has been given to a five-company group formed to select a design for an electric-power reactor and to make an initial economic evaluation of the design.

Members of the group, which can claim experience in atomic energy studies, are American Gas and Electric Service Corp., New York; Commonwealth Edison Co., Chicago; Pacific Gas and Electric Co., San Francisco; Union Electric Co., St. Louis; and Bechtel Corp., San Francisco.

The companies call themselves the Nuclear Power Group and have set up headquarters in Chicago.

Doesn't Have to Pay

The first four firms own more than 10.5 million kw of electric generating capacity with combined annual kw-hr sales exceeding 48.5 billion. Bechtel Corp. is an engineering and construction company.

According to a joint statement by presidents of two of the firms, the first nuclear power plant is visualized as developmental. It need not be economic, even though completely successful in producing power.

These firms will, like the Duquesne-Kidde team, pay the costs of a 1-year study and report their findings to AEC.

Some employees of each company will be cleared to examine "pertinent" phases of the government nuclear power program.

Group to Study Manpower

Keeping a close watch on the national labor force will be a new, 24-man "Advisory Committee on Manpower Resources for National Security."

Formation of the group was announced last week by Defense Mobilizer Arthur S. Flemming, who said the members will help him in preparing a report for President Eisenhower. The committee will gage the effect of military manpower policies on the number of persons available for other defense activities.

Covered in the study will be the supply of manpower needed to fill armed forces and civilian employment requirements and to operate a national security training program. Attention will be focused on present and potential numbers of technical, skilled, professional, scientific, and farm personnel.

Charles F. Honeywell

Personnel:

Honeywell chosen as new BDSA head.

Newly created Business & Defense Services Administration has buckled down to business with the naming last week of its first director.

Charles F. Honeywell, former business associate of Commerce Secretary Sinclair Weeks and, since last January, a special assistant to the secretary, was selected for the post.

Wallace On Loan

This sets off another chain of shifts in management. At the same time, H. J. Wallace steps into the job of assistant administrator of the agency, a vacancy created with the return of Samuel A. Crabtree to Republic Steel Corp.

On loan to the government without compensation from his position as vice-president in charge of sales for U. S. Steel Corp.'s National Tube division, Mr. Wallace's main responsibility will be administration of the BDSA's various metals divisions.

He has been serving as director of the Iron & Steel division. Under the rotation system, he will be followed in the post by Kenneth J. Burns.

Multiple spindle automatic builders do not deny the importance of good frame design. As early as 1920 Cone's revolutionary frame was substantial evidence that Cone did something about it.

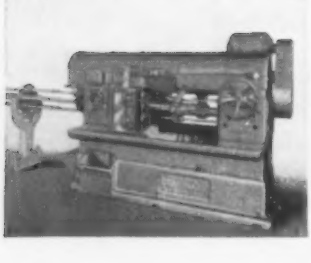
For some time there has been discussion concerning the relative merits of the use of 100% carbide tooling on multiple spindle bar automatics. There has been very little information made available about successful carbide application to this type of machine by its builders or by carbide suppliers. But Cone is doing something about it.

The Conomatic Carbide Development program is accumulating much helpful information for "automatic" users through test runs under production conditions. The illustration is an example of such information applied to an actual production run. Full data is available.

Action speaks better

MATERIAL—ALUMINUM: Hole drilled with 1" and 1 1/16" dia. drills to 1½" depth, and tapped to ¾" depth.

	HSS	CARBIDE
Cycle Time	90 secs.	11 secs.
Work Spindle Speed	270 R.P.M. at 104 S.F.	830 R.P.M. at 320 S.F.
Tool Wear	5,000 pcs. per grind	20,000 pcs. per grind



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

Map Freight Absorption Policy

Western steel producers get set for sales battle . . . Hope to keep absorption to minimum, particularly on scarce items . . . New capacity means hot tinplate fight—By T. M. Rohan.

Western steel producers were busy last week mapping out freight absorption practices in a battle for markets.

Sales outlets for out-of-area producers were studying customer-product lists and freight rates for every competitive advantage. For them it will be a battle of lower base prices and high freight vs. higher western base and low freight.

Within the western market producers hope to keep freight absorption to a minimum, confined in some cases to only a few products. Hottest battle may be on wire products between U. S. Steel's northern California mill at Pittsburg for Los Angeles customers and the Bethlehem mill there for northern California sales. Only sure winner will be the Southern Pacific and Santa Fe railroads.

Scarce Items Unabsorbed . . . Western steel customers seeking hard-to-get items such as plates, wide flange beams, seamless tubing and some types of hot rolled sheets have little to gain from the freight absorption policy. Most western outlets have received iron-clad lists of products from eastern offices on which no freight will be absorbed, mainly the items in short supply.

On reinforcing bars, small structurals and carbon bars competition will be relatively unaffected since major markets all have producing units within the area. Additional sales pressure will be brought on regular nearby markets to minimize losses from freight absorption which has been in practice for some time.

Tinplate Battle Looms . . . The western tinplate market, about 18 pct of the national total, will be hotly competitive. Eastern suppliers such as Weirton and Jones & Laughlin have about a 75¢ per 100 lb lower base price on lighter base weights compared to U. S. Steel's Pittsburg, Calif., mill and Kaiser. A transcontinental freight rate of about $1.02 per 100 lb compared to about $1.90 for regular steel products will also help. On heavier base weights, however, they have higher prices and must meet western produced prices.

Western can companies currently have loaded inventories due to hedging early this year against a possible steel strike. With the Kaiser tinplate mill now getting into full stride, a major battle for reduced markets appears certain.

Kaiser and Pacific States Steel Corp. at Niles, Calif., who have traditionally absorbed partial or full freight, are expected to continue the policy and enlarge it where necessary.

License More Hydropower

A 50-year license has been granted by the government to California-Oregon Power Co. under which it will construct a 50,000-kw hydroelectric power project on the Klamath River in Oregon.

Construction is not to begin until an agreement is reached with Interior Dept. for continued use, after 1967, of water stored by an upstream federal dam. Operation of the private project is dependent upon water released from the federal project.

Called Big Bend No. 2, the proposed project will cost about $9 million, including a 52-ft diversion dam and tunnel to the powerhouse containing waterwheels and two 25,000-kw generators.

Western Recession? . . . Two major western steel mills this week are scheduling production at over 110 pct of rated capacity. Overall western ingot rate last week was scheduled for 99.0 pct of rated capacity, highest of any U. S. district and reached 95.3 pct. Major mills have heavy order books for remainder of the year and on a few items are already partially booked into 1954.

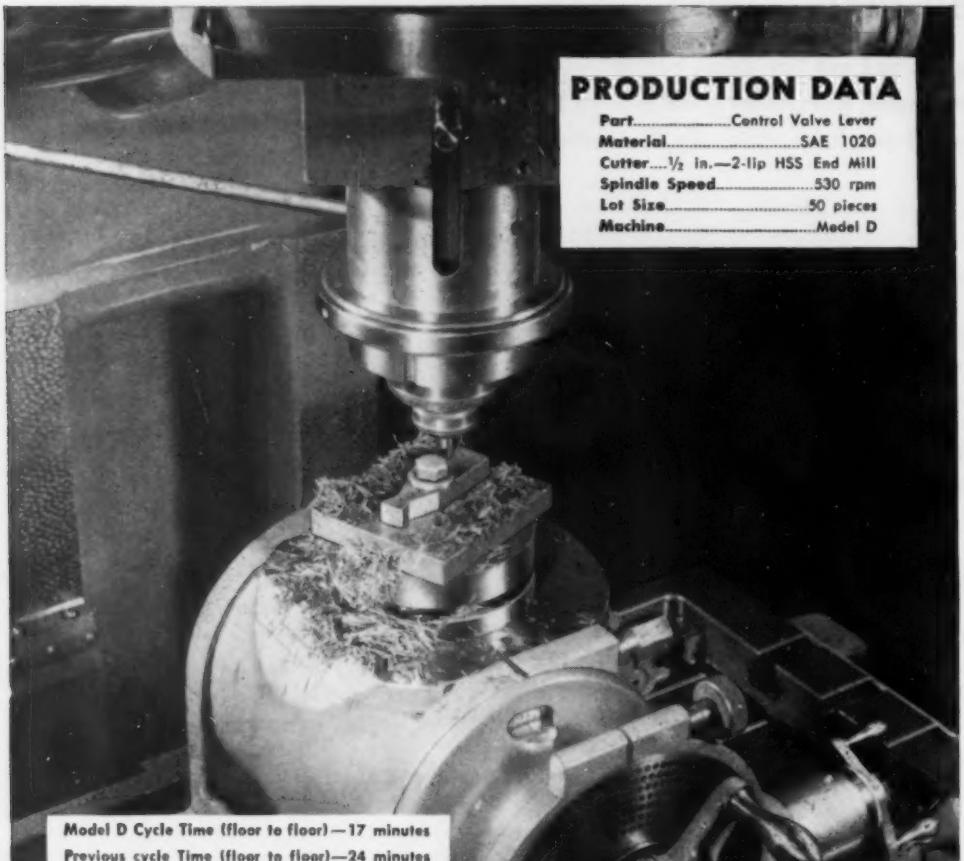
New Sales Front . . . Seamless tubes from Colorado Fuel and Iron Corp.'s new $40 million Pueblo mill dedicated last week are already in use experimentally. Next move is setting up sales outlets. Although C. F. & I. salesmen regularly call on drillers to sell cable, a distributor setup would get better coverage but decrease profit margin.

The Pacific Northwest is also becoming the major new front for the bulging integrated C. F. & I. mill now up to 1,485,000 tons annual capacity.

Watch Airplane $$$ . . . Aircraft engineers attending the Society of Automotive Engineers national aeronautic meeting in Los Angeles last week took their cue from recent Air Force budget cutbacks and talked mostly of how to save dollars. Building structurally stronger airplanes for higher speeds at less money appeared to be principally a problem of standardization and closer planning-production coordination.

Morris Harper of Douglas Aircraft pointed up the major problem in saying, "I don't know who can say how many changes there should be in design, but there are far too many now." G. A. Evans of Glenn Martin Co. said their tooling engineers work right in the design department, mostly to tone down costly tooling ideas.

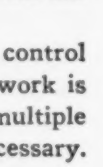
This part  is finish milled direct from the blueprint, with a single setup, in 17 min.!



Kearney & Trecker Model 2D Rotary Head Milling Machine saves six hours on 50 piece run

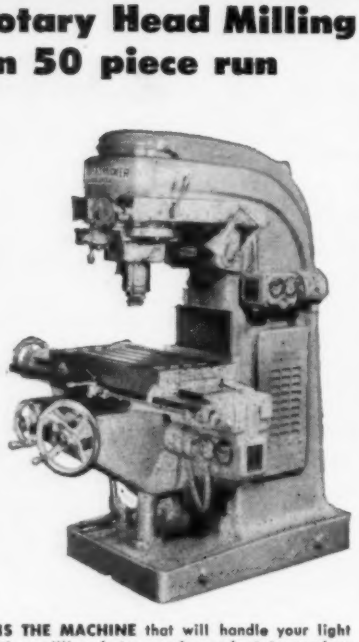
HERE is another example of the tremendous time and tooling savings possible with the rotary head milling method.

This manufacturer used to complete a control lever every 24 minutes. Now the same work is completed in only 17 minutes... and no multiple setups or expensive form cutters are necessary. The blueprint is the only guide the operator needs — the machine's precise mechanical control of the cutter's angular and radial movements does the rest.



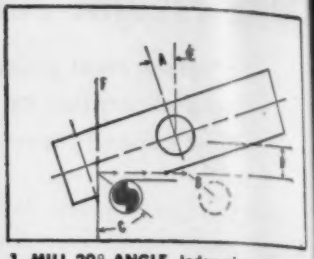
Here's the Rotary Head Milling Machine Production Idea Booklet. It contains several examples of how this method has been found exceptionally efficient in solving production, die, forging and metal pattern milling problems. It's yours for the asking.

Address requests to Kearney & Trecker Corp., 6784 W. National Avenue • Milwaukee 14, Wisconsin

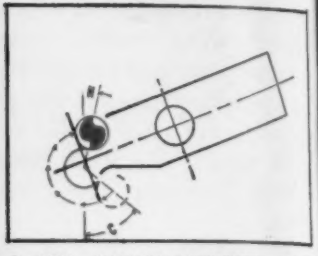


THIS IS THE MACHINE that will handle your light production milling faster, easier and at tremendous savings over any other method. If you have any production problems in plastic molds, die-casting, forging and stamping dies, or selected production milling operations — investigate the Model 2D.

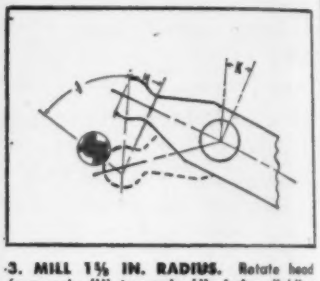
KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS



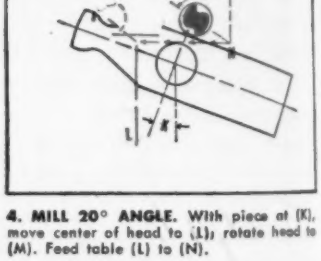
1. MILL 20° ANGLE. Index piece to angle (A), offset spindle slide to radius (B), set rotary head to angle (C), saddle to (D). Feed table (E) to (F).



2. MILL .642/.645 DIAMETER. Rotate head angle (C) to angle (H).



3. MILL 1⅛ IN. RADIUS. Rotate head fromangle (H) to angle (J), Index dividing head from angle (A) (Oper. 1) to angle (K).



4. MILL 20° ANGLE. With piece at (K), move center of head to (L), rotate head to (M). Feed table (L) to (N).

5. MILL SAME FORM ON OPPOSITE END. Repeat operations 1 through 4 by indexing the workpiece to angle (A-Oper. 1).

There's No Panic Among Builders

New orders below shipments . . . But builders aren't singing the blues . . . Subcontractors first to feel lull . . . There's still room for positive action—By E. J. Egan, Jr.

Although new orders in the machine tool industry are not keeping pace with shipments, the drop in backlogs does not seem to be provoking undue pessimism among representative firms contacted for their views on the market outlook.

It appears that a little "breathing spell" might almost be welcomed in certain quarters, provided, of course, that incoming business doesn't decrease to the point where the pinch might really begin to hurt. But no one really expects to have to uncork the red ink bottle or to lay off skilled workers.

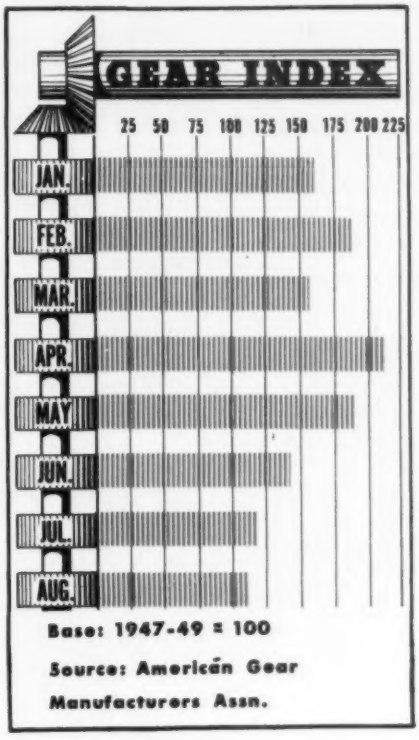
Subs Feel It First . . . In many cases as the lull in new business becomes noticeable, subcontractors are first to feel the effect. While some tool builders, pleased with their subcontracting arrangements, are still seeking additional help from this source, others are looking forward to bringing all phases of production back into their own plant facilities.

Where subcontracting has been very extensive in order to meet defense demands promptly, there have been numerous problems in inspection and quality control, long distance liaison and communications, production and shipment schedules, etc. A drop in business sufficiently large to call for elimination of subcontractors and these attendant expensive practices might concievably result in a bigger net profit for the prime manufacturer.

Get Positive Action . . . But there's plenty of room for positive action, too. Sales will be eagerly sought after, and sales promotion programs will be stepped up. Research and design staffs will seize opportunities wherever possible to build new features into their machine tools and perhaps uncover some startlingly different models. The trend toward automation is moving ahead by giant strides and tool builders don't figure on doing any napping along the way.

The recent European Machine Tool Exhibition held in Brussels, Belgium, has sparked a lot of conversation about the degree of competition to be expected from European manufacturers in overseas markets as well as here at home.

Can Build More . . . With the dollar shortage still prevalent in so many countries, prospects there can't do much about exercising their preferences for the generally more powerful and rugged American made machines. Working night and day to help erase these long-remembered preferences are the European tool builders who have vastly increased in number as well as productive capacity since World War II.



It seems unlikely that near term sales of American machine tools will come anywhere near approaching 25 pct of total output, as was the case in the prewar era.

The threat of increased sales of foreign machine tools in this country is something else. Some American manufacturers are concerned about it; some are not. And there would seem to be logical reasons for both points of view.

No Bogey Here . . . For example, one large American firm counted 164 European machine tool exhibitors at the Brussels show who could be considered as direct competitors.

Other domestic builders have fewer worries from this direction, pointing out that their foreign counterparts for the most part lack certain elements necessary for large volume sales here. Chief among these handicaps would be the lack of well established, aggressive sales organizations, and inadequate facilities for proper servicing of equipment with replacement parts.

When to Replace . . . Management guesswork as to the best time to replace obsolete production equipment is gradually being supplanted by sound decisions based on logical facts and figures.

In a paper presented last week at the Fall Meeting of The American Society of Mechanical Engineers in Rochester, N. Y., Carl M. Beach, vice president of Cincinnati Milling and Grinding Machines, Inc., explained the equipment replacement formula developed and advocated by the Machinery and Allied Products Institute.

Life Saver for Small Fry

*Another example of how Carpenter *Application Engineering Service is working for industry*

You know how youngsters are on a trip—they love to be near the window to make sure they see everything whizzing by. But that can be dangerous . . . a door can fly open, a tragedy can strike. That's why this safety door lock was invented. Quickly attached, it keeps children in . . . enables them to enjoy the trip, safe and secure. To open the door, the driver simply pulls a release knob. But the production problem wasn't as simple as that.

The material for the lock had to be economical to fabricate, had to provide high strength, corrosion resistance and a bright finish. Cold rolled steel, chrome plated, was tried but it just couldn't make the grade.

Then Carpenter was called in and Application Engineering Service went to work. Results: They used Stainless No. 6 (Type 430), a bright, high-strength, easy-working Stainless produced by Carpenter for just such jobs. No. 6 met all the requirements . . . and made the lock a real sales winner.

Here is another example of how Carpenter A.E.S. is working with industry to unearth new ways to make products more functional, more salesworthy, more economical to produce. You can count on this Carpenter service to help bring these advantages to your plant, too. It goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

Carpenter STEEL — Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

REPORT TO MANAGEMENT . . .

Homes build broader markets

Homebuilding is simultaneously a cause and symptom of prosperity. Our stake in homebuilding is not so much the immediate dollar volume of construction it generates as the market for consumer goods it broadens and fortifies. The homebuilding boom has provided much of the market for household appliances, autos, furnishings, furnaces, etc.

Has lag come too soon?

And now home building is lagging. A pausing point was natural, but has it been reached too soon? In July and August, income and employment were at alltime records--and in those same months building suffered its first marked decline. Far from saturated, the market for homes seems to be in need of certain judicious stimuli to uphold the rate at the highest possible level. Coincident with the building dip has been the shrinkage of available mortgage money. Real estate men consider this a permanent rather than transient dislocation, want the assist pledged by Washington if mortgage lending trouble ripens. Money has been easing but real estate men claim it has followed the line of best discount--not towards home mortgages.

How home rates dipped

Is homebuilding on a serious downtrail? Not yet--although depressing signs are cropping up. Roof shingles were capping new homes at peak rates this year until July when the number of new nonfarm dwellings slipped to 96,000 against 102,600 for July '52. August 1953 registered a further decline to 94,000 units against almost 100,000 a year ago.

Why demand's still strong

Homebuilding has enough demand, economic impetus to race at an outstanding level next year. Relatively unimpaired next year will be employment, income. With from 57 to 59 pct of America's 43 million families owning their own homes, there exists an immense replacement market. Because high incomes are filtering down to more families too poor to own homes before, a new market area is constantly enlarging. In the replacement market is a deep reservoir of buying potential based on the ability of homeowners to finance new home mortgages on home assets now in their hands. Americans own $250 billion worth of homes today, owe on them only $50 billion.

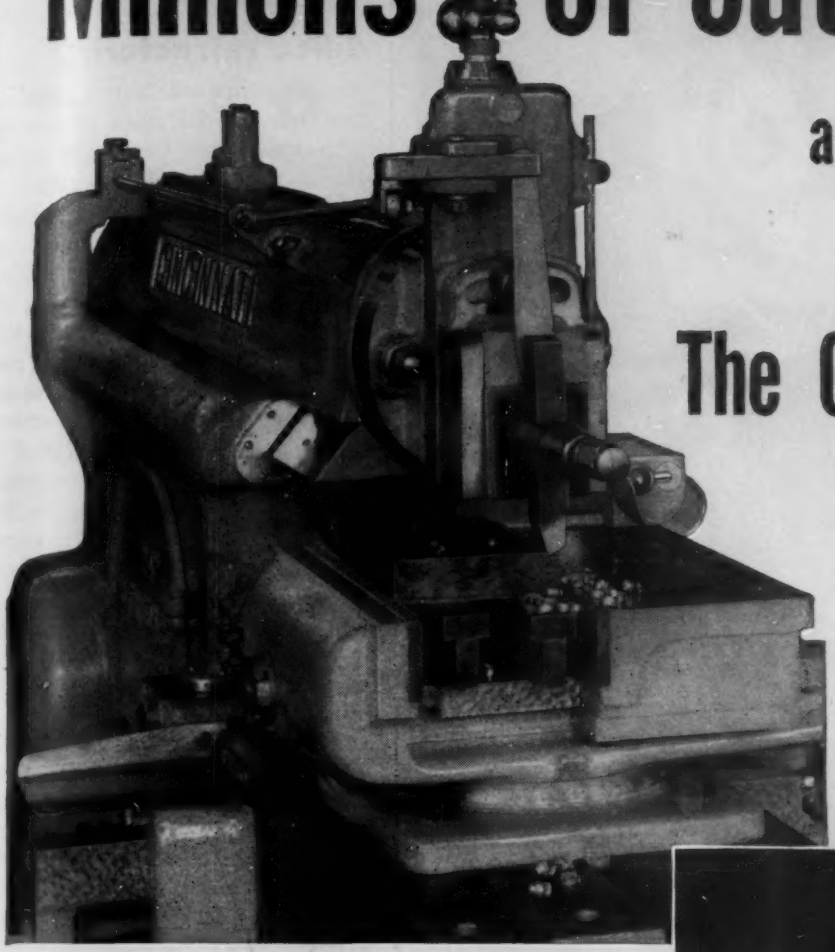
Homebuilding catalyst is cash

Is, as many claim, the prime propulsion to a high building rate the sheer mass of new household formations? This factor poses a need for homes but an upsurge in personal income furnishes the catalyst. In 1948 new household formation peaked at 1.6 million, then crept back to today's more normal rate of under 900,000. Also in 1948 we had a backlog of demand for homes pent-up by war. Yet, monthly average '48 rate of new homes was 77,600. Disposable personal income in that year was only $188 billion. But when income shot up to $206 billion in 1950, the home rate was swept up with it, attaining a record monthly average of 116,300 units. What released imprisoned need? Cash. And since the consumer will continue prosperous, his desire to own a new home or replace an old one should be nurtured fully.

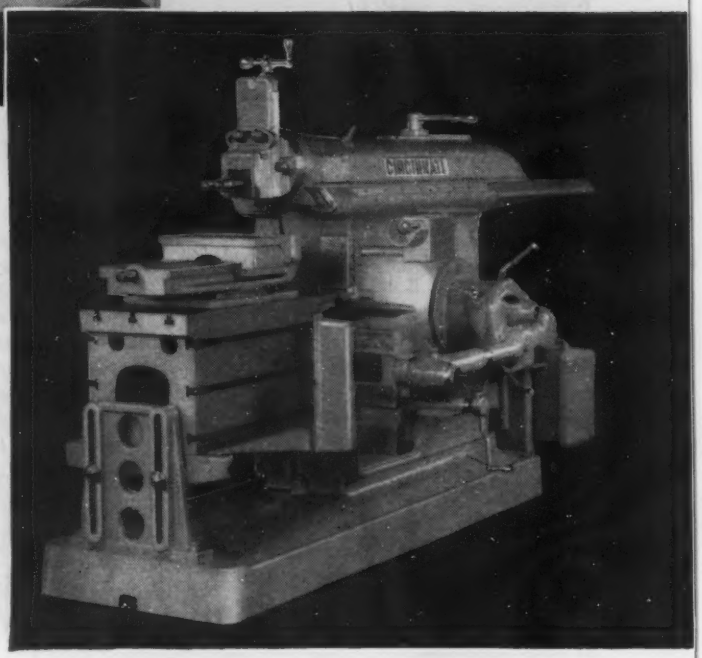
What industry can do

Can industry really influence homebuilding or must it be a sideline observer? Industry's giving the worker income security builds the psychological uplift necessary before he will commit himself to a 25-year home mortgage. Installation of a company home counseling service could be a valuable supplement to sometimes conservative outside advice. Certification of workers as good loan security risks could exercise a certain suasion over mortgage lenders. What are industry's stakes? Freshening the market for its goods, stabilizing its labor force, committing the worker to a certain minimum level of purchases and the initiative to attain them.

Millions of cuts without a fault...



The CINCINNATI Tool Lifter!



The dependable Cincinnati Tool lifter, with positive return and lift, eliminates tool damage—operates at high speeds—and with angular settings of tool slide or clapper box. Protects and permits use to maximum advantage of carbide or high speed cutting tools.

After simple setting it is automatic, relieves operator and increases production.

Write for Shaper Catalog N-6.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

—Free Publications—

Continued

Silica refractories

Process of manufacturing silica refractories is described in detail in a technical brochure put out by Harbison-Walker Refractories Co. Of particular interest in the publication are sections covering the mechanization of batch control, impact pressing, direct setting of brick from presses to tunnel kiln cars, complete enclosure of and continuous dust removal from all equipment in which dust is generated. The company has also issued a brief booklet entitled *Refractories and Bill Smith* which stresses the importance of refractories in everyday life. *Harbison-Walker Refractories Co.*

For free copy circle No. 13 on postcard, p. 85.

Transmission belting

Interesting feature of Goodyear's belting is that it has rayon plies instead of cotton. The company states in a new folder that rayon belting is stronger, has superior fastener-holding ability, less stretch, longer life. *Goodyear Tire & Rubber Co.*

For free copy circle No. 14 on postcard, p. 85.

Radial, boring mill

Boring mills and radial drilling machines are featured in a Cincinnati Gilbert Machine Tool Co. catalog. The publication covers radials, table and floor-type boring mills and accessories, and briefly describes main product features. *Cincinnati Gilbert Machine Tool Co.*

For free copy circle No. 15 on postcard, p. 85.

Water sampling

Informational leaflet outlining some of the factors involved in obtaining useful samples required for proper control of water conditions in a powerhouse has been released by Allis-Chalmers Mfg. Co. The literature tells which samples are important, when samples should be taken, where to obtain them and how they should be drawn. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 16 on postcard, p. 85.

aluminum FASTENINGS...

IMMEDIATE DELIVERY!

Make Harper your source of supply for all your needs in aluminum fastenings.

Machine Bolts	**Machine Screws (Slotted and Phillips Head)**
Carriage Bolts	**Tapping Screws**
Nuts	**Wood Screws (Slotted and Phillips Head)**
Wing Nuts	**Washers**
Cap Nuts	**Lock Washers**
Rivets	
Cap Screws	

Complete stocks in a wide range of sizes assure you prompt delivery.

The H. M. Harper Company has specialized for almost a third of a century in fastenings of non-ferrous metals and all stainless steels, and is the largest manufacturer in this field. Over 7,000 items are available from stock in aluminum, brass, naval bronze, silicon bronze, Monel and all stainless steels.

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The H. M. Harper Company
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Please send me the following catalogs:
( ) Catalog on Harper Aluminum Fastenings
( ) Catalog 25 on Harper Everlasting Fastenings

Name.....

Company.....*Position*.....

Address.....

City.....*State*.....

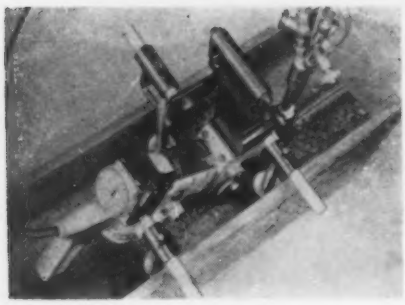
NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 85 or 86.

Attachment guarantees close tolerance grinding

Called the Arnoldair, a high-magnification air attachment guarantees the production of cylindrically ground work to a remarkably consistent close tolerance. The regular Arnold gage is provided with a Federal dial indicator which contacts a plunger riding continuously on the part. The operator can watch the indicator and see the exact size of the part at any time during the grinding operation. The Arnoldair cushions the effect of minute roughness of the work surface resulting in a steadiness of the dial indicator needle as workpiece approaches required size. *Federal Products Corp.*

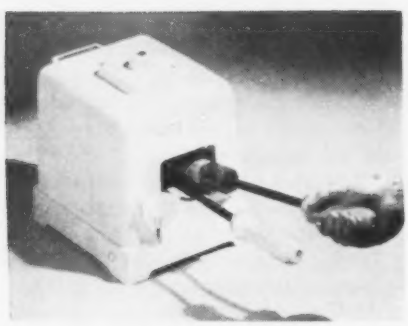
For more data circle No. 17 on postcard, p. 85.



Machine flame cuts I beams and flange beams

Making clean and accurate longitudinal cuts through the webs of I beams and wide flange beams, from 5½ to 11¾ in., is possible with a new model HP Cadet flame cutting machine. It is guided by three lateral adjustable rollers. The Model HP can also make straight cuts or cut limited irregular shapes from plates. Rollers run along a 1½ to 2½ in. steel strip or angle iron fastened to the plate. Speed of travel and gas flow to torch are controlled by fingertip adjustments on handle. *American Pullmax Co., Inc.*

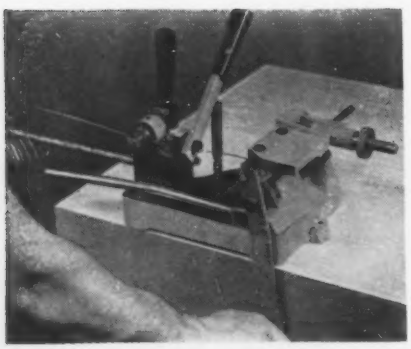
For more data circle No. 18 on postcard, p. 85.



Soldering furnace uses radiant heat

New gas-fired soldering furnace, using a radiant burner as a heat source, is capable of heating, in less than 8 min, two 4-lb irons from room temperature to 900°F, or one 4-lb iron to 1200°F, with a heat input of 9100 Btu per hr. Other features are simplified maintenance, longer life of soldering coppers, and provisions made for operators' comfort. The burner is located so that mechanical shock and flux corrosion damages are held to a minimum. Lower heat input is possible because of higher heat transfer rates in radiant heat. *Selas Corp. of America.*

For more data circle No. 19 on postcard, p. 85.



Spring winder requires no special skill

The Di-Acro spring winder is a complete self-contained unit with a special cutoff lever incorporated right into the machine. Designed to eliminate special orders or costly delays, it can be used to form individual springs, or to replace automatic machines on expensive short run production. Any gage wire, to ⅛ in. diam, can be wound into extension, compression, torsion and flat springs. Round, flat, square, or rectangular shaped stock can be formed into springs of any length. The hand operated winder has six arbors. *O'Neil-Irwin Mfg. Co.*

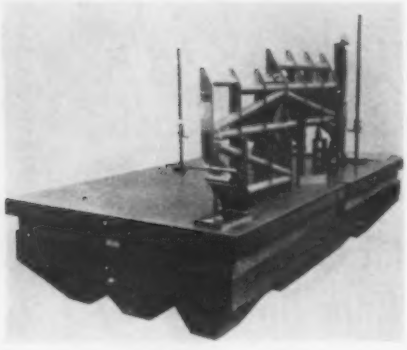
For more data circle No. 20 on postcard, p. 85.

Turn Page

Tester detects and locates leaks in castings

New vertical pressure testing machines detect and locate leaks in castings; brazed, welded and soldered assemblies. These air-operated, electrically controlled machines subject parts to a 10-sec automatic check in which the part or a specified area in the part is charged with a given volume of air. Loss of air pressure, indicating a leak or flaw in the part or various areas in the part is indicated by signal lights through an extremely sensitive measuring system. Air test controls are in a panel at the rear of the machine. Electrical controls are in a side panel. The machine operates from 80 psi air source and a 100 v line. Precision pressure gages in the cycle control panel permit individual control of each station. Complete cycle time to load, check and unload two parts is 17 sec. *Hautau Engineering Co.*

For more data circle No. 21 on postcard, p. 85.



Surface plates used in multiples

The multiple unit surface plate consists of two or more granite surface plates on a single stand that is designed to provide a means of aligning, and keeping in alignment, surfaces of the several plates. Advantages claimed for the unit are: It makes possible and practical larger surface plates; there is more clamping space because spaces between plates are effective and convenient T slots. Surface plates making up the multiple unit can be separated and used alone. Each plate is adjustably supported at three points on the special stand. A very fine vertical adjustment makes it easy to put the top surfaces into the same plane. *Elkro Co.*

For more data circle No. 22 on postcard, p. 85.

Grinder rated at 60-70 ceramic parts per minute

Two parallel surfaces of ceramic insulators and one surface of trimmer bases are ground on a 15-in. vertical spindle grinder at 60 to 70 pieces per minute. The vertical column of the machine supports the grinding heads upon vertical slides and each head slide is provided with a handwheel and feed screw mechanism for raising and lowering the heads. A steel tank for the wet grinding system is set at one side and collector trays divert the coolant to this tank. Rotary carriers for the insulators consist of circular plates made of Celeron Grade C, having openings into which the ceramic parts are placed by the operator. Maximum overall stock removal is 0.005 in. Two 7½ hp, 1800 rpm motors with proper shaft extensions power the unit. *Gardner Machine Co.*

For more data circle No. 23 on postcard, p. 85.

Gage accessory segregates ball bearings

Segregating ball bearings into any one of ten dimensional classifications after gaging can be done quickly and accurately with a visual gage accessory. Shown is a ten place classification tray being used with a Sheffield visual gage of 10,000 to 1 magnification. The balls are gravity fed from the V trough into a receiving hole in a slide. Moving the slide carries the ball into position beneath the gaging spindle. The operator takes the reading and moves the tray until the proper size compartment is under the ejection chute. Then he releases the ball permitting it to roll down the chute into the tray. No skills are required to classify ball sizes in increments of 0.000010 in. *Sheffield Corp.*

For more data circle No. 24 on postcard, p. 85.

Turn to Page 94

STAINLESS WIRE

PRODUCED AT HIGH SPEEDS AND LOW COST BY MODERN

Vaughn®

WIRE DRAWNIG MACHINERY

Bright, gleaming Stainless . . . hard and tough to draw, but drawn by Vaughn with ease, speed and flexibility! Specify Vaughn Wire Drawing Machinery for your stainless needs: Motobloc®, Motoblox®, Ringblox® and Cone Machines. *We'll gladly consult with you.*

THE VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars & Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

V® *"Quick on the Draw!"*

— New Equipment —

Continued

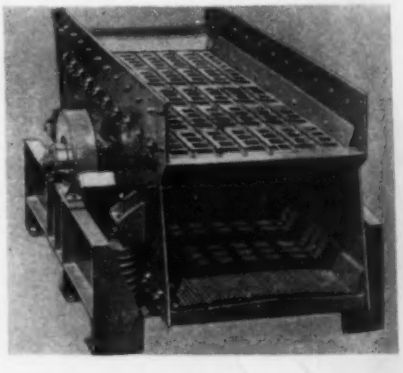
Tool bits

Made from a molybdenum-tungsten alloy, high speed steel tool bits, known as Besly Bonus Bits, are available as finish ground bits in 10 sizes of squares from 3/16 to 1 in., accurately ground to 0.001 in. for ease in alignment. The bits are said to have excellent red hardness characteristics, resistance to abrasion and unusual toughness. These factors, plus a full length tool bit with efficient cutting ability, promise economical, general purpose performance on a wide variety of metals at a broad range of cutting speeds. *Besly-Welles Corp.*

For more data circle No. 25 on postcard, p. 85.

Vibrating screens

Redesigned to give heavier service, more efficient operation and greater durability, the Mesabi type vibrating screens are now available in single deck for scalping and two-deck for scalping or sizing. In the two-deck scalping screen, the top deck is ½ in. punched plate and the bottom deck is wire mesh; in the sizing screen both decks are wire



mesh. The single-deck sizing screen has a ¾ in. punched plate deck. Standard punched plates have square openings ranging from 2 to 8 in., in ½ in. increments. Main frame on 4-ft screens include an 18 in. car channel reinforced with 8 in. cross beams; 5 and 6-ft wide screens have 18-in. I beams reinforced with 8 in. crossbeams. Inner and outer bearings in all sizes are SKF. *Pioneer Engineering Works, Inc.*

For more data circle No. 26 on postcard, p. 85.

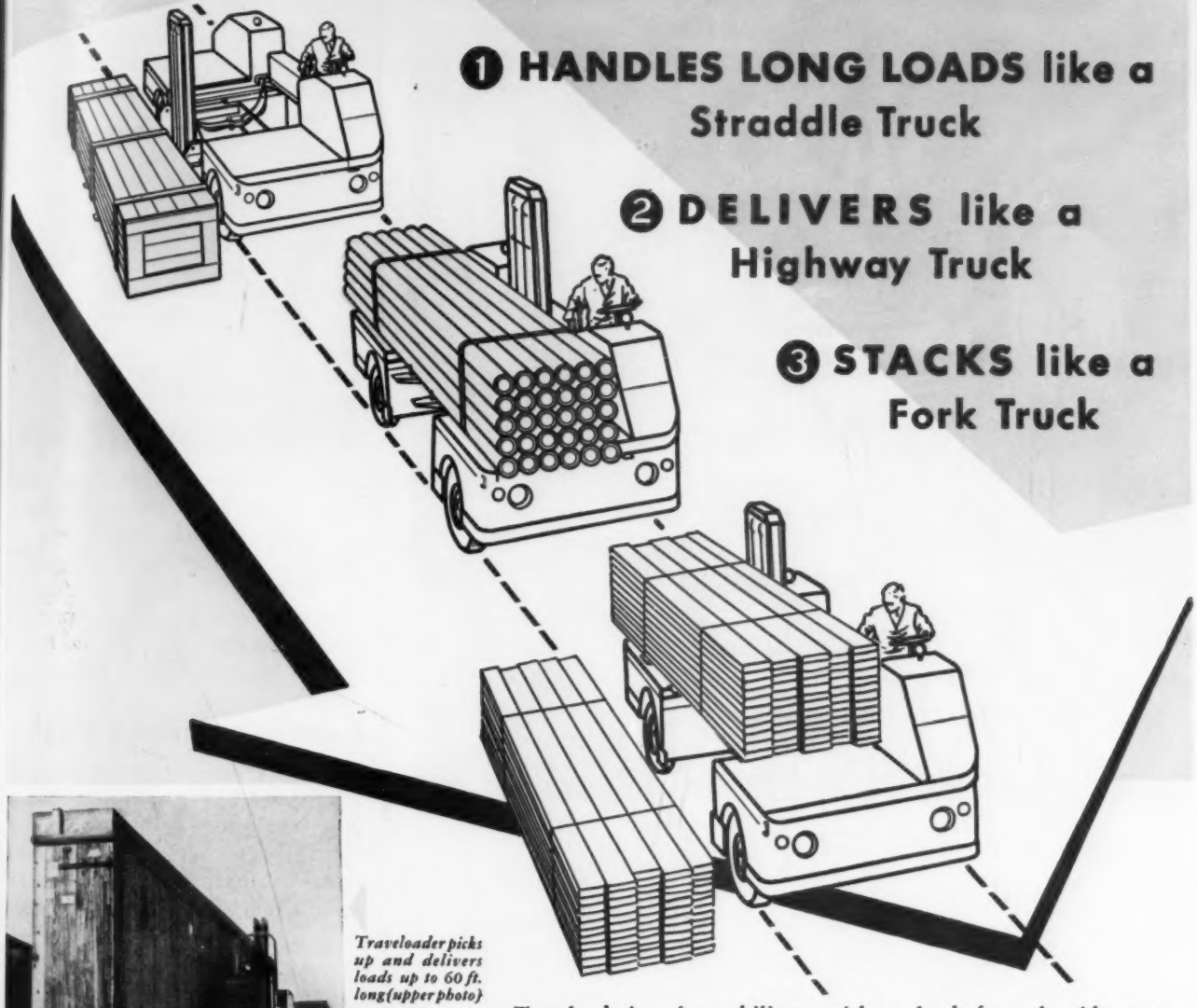
Turn Page

Only Traveloader

1 HANDLES LONG LOADS like a Straddle Truck

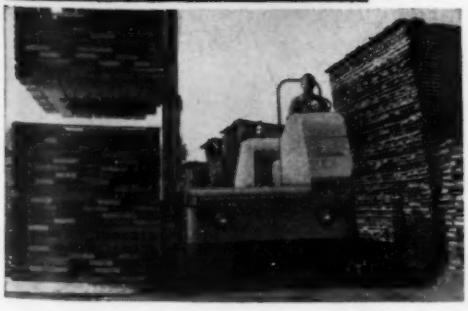
2 DELIVERS like a Highway Truck

3 STACKS like a Fork Truck



Traveloader picks up and delivers loads up to 60 ft. long (upper photo)

Traveloader can operate in 10 ft. aisles and stack up to 12 feet.



Traveloader's unique ability to pick up loads from the side, carry them lengthwise and unload or stack them from the side, opens up an entirely new field in mechanized handling of long, unwieldy or bulky loads.

Thus this one machine, operated by one man, often replaces two or three handling units now used on such jobs. The cost savings are obvious.

It offers many other advantages. Weight is distributed equally over four wheels, permitting heavy load handling on floors or ground conditions not practical for other devices. It can stack up to 12 ft. from 10 ft. aisles. It can handle palletized or unpalletized loads with forks, or loads in a sling with a crane attachment. It delivers loads at speeds up to 30 MPH.

Write for descriptive bulletin containing action photographs, construction details and specifications.

THE BAKER-RAULANG COMPANY
1227 WEST 80th STREET • CLEVELAND 2, OHIO

The Baker-Lull Corporation, Subsidiary, Minneapolis, Minnesota
Material Handling and Construction Equipment

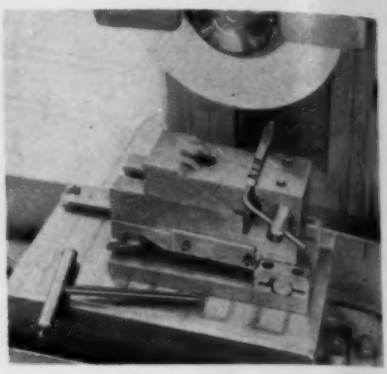
Baker
industrial trucks

New Equipment

Continued

Workholding device

New vise designed for precision grinding and square within 0.0001 in. or less has an adjusting stop and down-holding feature which give dependable, accurate positioning of



the workpieces. Clamping jaw swivels to allow holding tapered and odd shaped workpieces. It holds round stock from 1/16 to 2½ in. diam in V block fashion; is attachable to angle plates. Jaw opening is to 3 in. *J&S Tool Co., Inc.*

For more data circle No. 27 on postcard, p. 85.

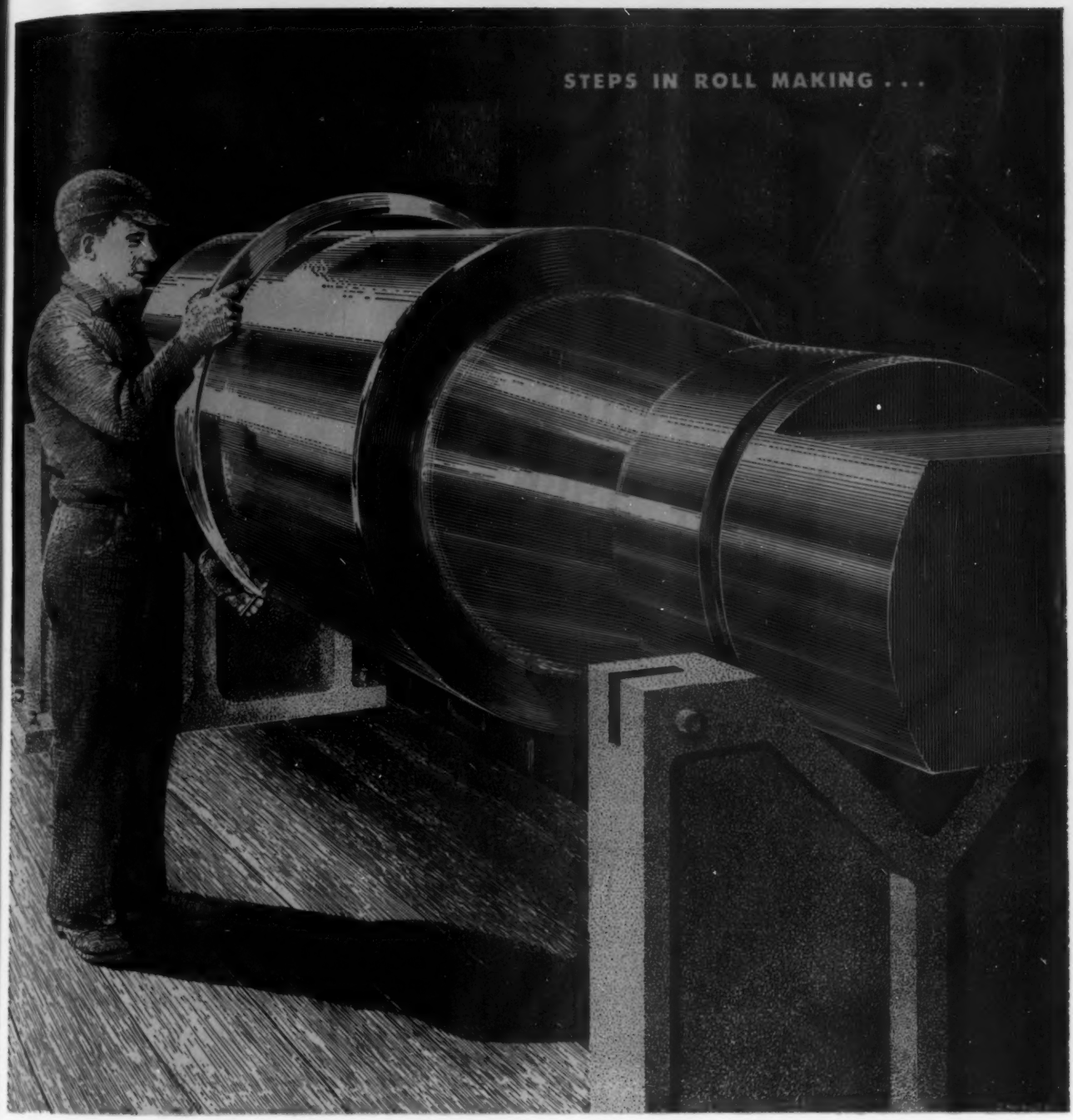
Revolving crane truck

This revolving crane truck has been found useful in handling molds and other equipment in storage and for miscellaneous work in maintenance. It has a capacity of 2000 lb and an overall height of 68 in. Its hook,

which is 60 in. high when raised and 10 in. when lowered, projects 24 in. over either side of the truck and is raised and lowered by power. The power is furnished by a separate pump and motor. The boom has a complete angular travel of better than 180 degrees. *Market Forge Co.*

For more data circle No. 28 on postcard, p. 85.

Turn Page



Inspecting a roll

A HARD MAN TO PLEASE

Roll inspection is as thorough and painstaking as every other step in roll-making at The National Roll & Foundry Company. • The inspector knows his job; he knows the rigid requirements that every National roll must meet. • Such careful attention to details results in top quality and top performance in every National roll. Just try them and see.

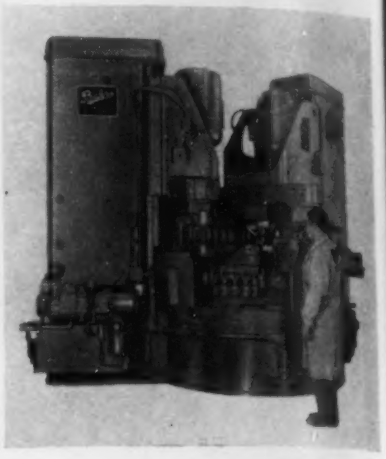
NATIONAL ROLLS

National Rolls

THE NATIONAL ROLL & FOUNDRY CO.

AVONMORE, PENNSYLVANIA

SPECIALISTS IN IRON, ALLOY IRON AND STEEL ROLLS AND CASTINGS, STEEL ARMOR CASTINGS



Connecting rod machine

A two-column automatic machine drills, reams and chamfers connecting rods at the rate of 565 per hr. It is arranged with tool steel, laminated, hardened and ground ways. A single operator loads the parts manually. Parts are hydraulically clamped and automatically ejected. The eight-station holding fixture is mounted on a 60-in. diam index table and heavy-duty ball-bearing construction is provided for all spindles. Other features include automatic lubrication throughout and special safety features. *Buhr Machine Tool Co.*

For more data circle No. 29 on postcard, p. 85.

Bright copper plate

New bright copper process reportedly increases plating production up to 60 pct, is easy to control, extremely economical and readily adaptable for both large scale and average job shop production. Said to be 98 pct efficient, the process saves nickel and eliminates the operation of copper buffing. Instant sparkling brilliance that occurs at the beginning of the plating cycle in a Rochelle cyanide solution is noticed immediately. It has exceptional speed of deposition and excellent throwing power. Brightness is achieved over a much greater range from zero to 80 amp per sq ft. Ductile deposits and low copper concentrations are featured in this process. Present equipment may be used. ***Smoothex, Inc.***

For more data circle No. 30 on postcard, p. 85.

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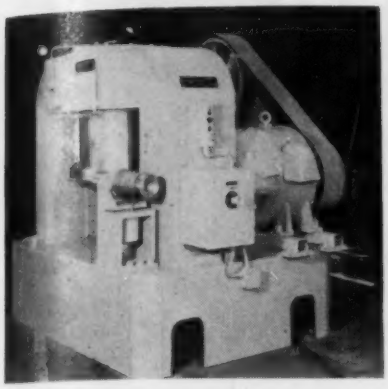


Vertical bull block

Different from ordinary bull blocks, Medart's has a drum that is overhung which gives an advantage in that the instant the last piece of material leaves the die, the coil drops by gravity off the drum to the unloading platform where it is removed by the operator without overhead cranes. This Series 6000/30 bull block features a self-contained worm drive and is capable of drawing at speeds up to 440 fpm. *Medart Co.*

For more data circle No. 31 on postcard, p. 85.

Interchangeable heads

Interchangeable measuring heads are a feature of Rimat dial bore gages. All standard gage heads for measuring O ring grooves, snap ring grooves, pitch diameters of

internal threads, small bores and most special gage heads are now interchangeable on one gage body. This makes it feasible to use precision checking equipment on development projects, short runs or contract work. *Rimat Tool Co.*

For more data circle No. 32 on postcard, p. 85.

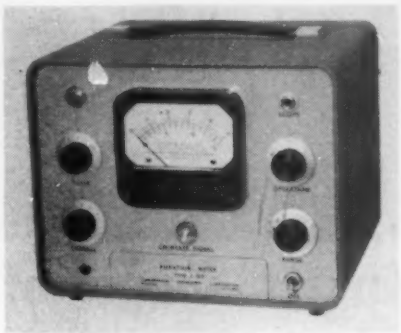
Machine noise control

Noise and vibration on machine tools from worn gears can be controlled with Kling-Oil until replacement is convenient. This No. 30 SAE oil has perfect lubricating qualities, but instead of being runny it is tacky. It stays put for longer periods than ordinary gear oils, and does not drip or splatter. *Magnus Chemical Co., Inc.*

For more data circle No. 33 on postcard, p. 85.

Vibration meter

Simplifying critical vibration testing, a new type 1-117 vibration meter may be used for on-the-spot field tests, trouble-shooting, in the laboratory, or as a go-no-go gage for production quality control testing. For permanent test installations, the entire chassis and panel may be easily rack mounted. Meter



can be used wherever standard 115 v, 50/60/400 cycle power is available. Suitably matched self-generating pickups are the only external items required for operation. Measured values of linear and torsional velocity of motion and peak-to-peak displacement are indicated on a direct-reading scale. *Consolidated Engineering Corp.*

For more data circle No. 34 on postcard, p. 85.

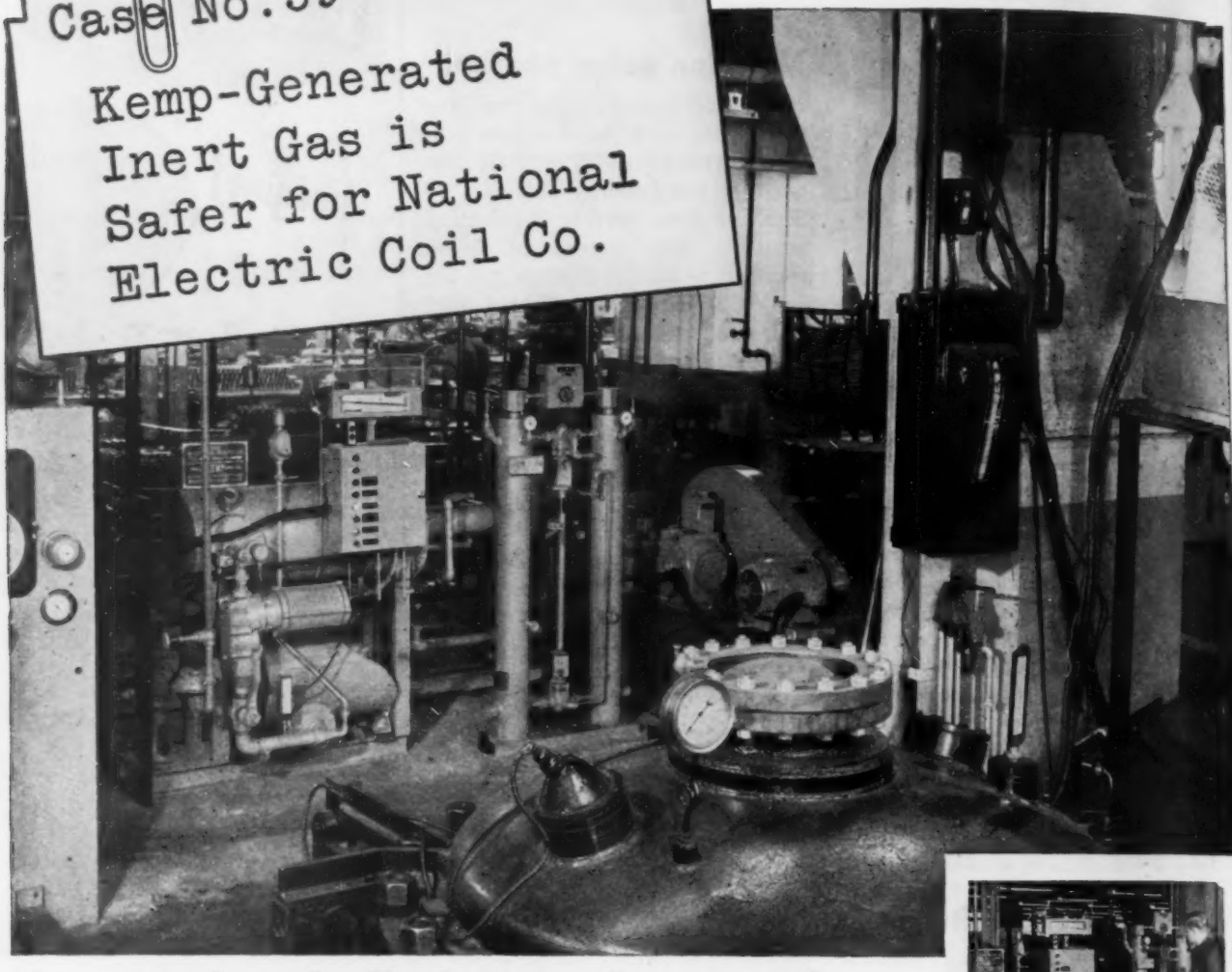
Packing compound

Coppersticks, a new self-molding packing compound for valves, pumps and expansion joints, features dispersion of pure copper flakes throughout the stick-shaped packing compound. Soft, yet form stable, and dry to touch, a few sizes cover requirements for the average industrial process plant. Density of compound prevents oxygen corrosion of pipe lines. *Surveys, Inc.*

For more data circle No. 35 on postcard, p. 85.

Case No. 59

Kemp-Generated Inert Gas is Safer for National Electric Coil Co.



How National eliminates danger of explosion . . . cheaply and conveniently

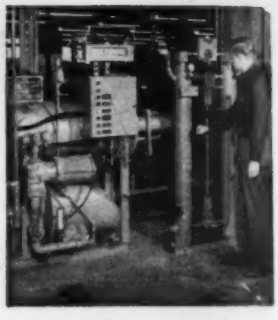
National Electric Coil Co., Columbus, Ohio, impregnates electric coils and windings by forcing in a hot sealing compound with inert gas under pressure. Formerly, the Company used air under pressure, but this created an explosion hazard. National then switched to CO_2 generated by melting dry ice. Although this decreased the danger factor, it was an extremely expensive operation and very inconvenient. To modernize this process and cut costs, National installed a Kemp Gas Generator, Model MIHE.

Kemp Solved the Problem—and More

Now National's Kemp installation delivers a completely satisfactory inert—eliminating any danger of explosion. And it delivers it at a *much lower cost* than the former generating method. In addition, Kemp supplies the gas at the rate required, plus a reserve for storage. As for convenience, the company considers their unit entirely automatic—it is practically never touched. According to Mr. D. E. Stafford, Chief Engineer, "It just sits there and operates."

Kemp Can Solve Your Problem Too

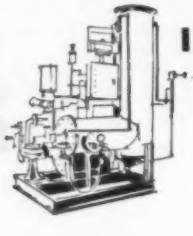
Every Kemp Generator is engineered for fast-starting, easy operation that saves both *time* and *money*. Kemp equipment delivers a chemically clean inert at a specific analysis . . . without fluctuations regardless of demand. And every Kemp design includes the latest firechecks and safety devices. For convenience, safety, and cleaner, more dependable gas—specify Kemp.



Mr. Wm. C. Graessle, of the engineering department, checking the operation. Generator features the Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste, without tinkering.

For more complete facts and technical information, write for Bulletin I-10 to: **C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.**

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS • SINGEING EQUIPMENT

The Iron Age

SALUTES

Alexander E. Walker

His chief traits are hard work, a sense of loyalty and responsibility and pride in a good job.

ALEX WALKER is old fashioned enough to believe that success and hard work go together. The 66-year-old president of National Supply Co. has used that formula throughout a business career spanning more than 40 years.

If he has one outstanding trait, it is his sense of loyalty and responsibility in his personal and business life and pride in a good job. Several years ago he publicly defended the oil industry, which his company serves, against insinuations that its interests are opposed to the public's.

While he expects a lot from his own people, he also does more than his share. Those who know him say his ability to make quick, sound decisions makes him an easy man to work for.

A good salesman, Alex also has distinguished himself as an organizer and financier. Under his tenure as president, beginning in 1940, National Supply Co. sales have more than quadrupled in terms of dollars despite periods of steel shortage. His company is the largest manufacturer and distributor of oil field machinery and equipment in the world.

Alex spent 21 years with Republic Steel Corp. and subsidiary companies, was general manager of sales for 8 years. He was executive vice-president of Pittsburgh Steel Co. in 1937 and 1938 until he joined National Supply in 1939.

He keeps himself in good physical condition, plays golf and likes to walk. He uses the company plane a lot both because he loves to fly and because it gets him there and back in a hurry. Alex probably doesn't realize it, but automobiles are something of a hobby with him—he loves to compare performance of the different makes he has driven.

Magnaflux

The inspection with Magnaflux detects hidden defects in the structure of metals. As applied to the manufacture of BRAD FOOTE gears, Magnaflux will point out the presence of even a minute, embedded imperfection that would prevent the gear or pinion from giving the ultimate service.

• Magnafluxing is one of a series of tests and controls employed by BRAD FOOTE. It helps to perpetuate the high quality which is traditional in gears made by BRAD FOOTE. It is another reason why you can order with confidence that the gears you receive will give you complete satisfaction.

• BRAD FOOTE makes all types of gears and pinions, and many styles of gearmotors, reducers, and transmissions. Our engineering staff will work with you on the design of any special gear or assembly you may need for your shop—or for use on equipment you make to sell.

• The complete facilities of the BRAD FOOTE organization are available whether you need one or scheduled quantities. We believe you will find satisfaction in working with us: Consider sending us your next inquiry which will receive prompt attention.

BRAD FOOTE GEAR WORKS, INC.

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Bishop 2-1070 • OLympic 2-7700

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Lemont, Illinois

PITTSBURGH GEAR COMPANY
Phone: ATlantic 1-9950
Pittsburgh 22, Pennsylvania

The Iron Age

INTRODUCES

L. S. MacKay, elected to vice-president and an officer, KAISER MOTORS CORP., and Willys Motors, Inc., Willow Run, Mich.

Dr. George M. Anderson, appointed head, Engineering Development group, THOMAS A. EDISON, INC., West Orange, N. J.

D. W. Thomas, resigned as executive vice-president and director, DUMAS STEEL CORP.

Howard H. Foster, elected treasurer, AIR REDUCTION CO., INC., New York.

Steve Yacus, elected secretary-treasurer, METAL FINISH, INC., Newark, N. J.

Luther E. Lawrence, elected assistant treasurer, FRUEHAUF TRAILER CO.

Col. Willard F. Rockwell, becomes chairman of the ROCKWELL SPRING & AXLE CO., Coraopolis, Pa.

John L. Ham, appointed director of Metallurgical Research Dept., NATIONAL RESEARCH CORP., Cambridge, Mass.

Rodney E. Sagendorf, appointed administrative assistant to the director of sales, THE DETREX CORP., Detroit.

William B. Huntley, Jr., appointed director of purchases, BRACE-MUELLER-HUNTLEY, INC., Syracuse, N. Y.

James P. Raugh, appointed to the executive staff, CUNNEEN CO., Philadelphia.

Ernst F. Klessig, appointed director of engineering, AIRWAY PRODUCTS, INC., Pontiac, Mich.

Harry J. Scott, becomes sales engineer, Pesco Products Div., BORG-WARNER CORP., Bedford, Ohio.

Fred R. Bayne, promoted to chief engineer, ALTEN FOUNDRY & MACHINE WORKS, INC., Lancaster, Ohio.

E. P. Additon, appointed sales engineer, BLAW-KNOX CO., Chemical Plants Div., Pittsburgh, Pa.

Robert Carr, appointed sales engineer, Chicago branch sales office, REED-PRENTICE CORP., Worcester, Mass.

William F. Lange, promoted to assistant chief engineer, PEABODY ENGINEERING CORP.

Clarence M. Feehan, promoted to assistant superintendent, Open Hearth Dept., Monessen Works, PITTSBURGH STEEL CO.

Howard K. Segerlind, joins Can machinery sales office, New York, THE E. W. BLISS CO., Canton, Ohio.

Leo L. Gill, appointed manager, Technical Sales Dept., HARBISON-WALKER REFRACTORIES CO., Pittsburgh.

Roger T. Kelley, named labor relations manager, Peoria plant, CATERPILLAR TRACTOR CO.

W. J. Sonnenburg, appointed Detroit district manager, ELECTRIC CONTROLLER & MFG. CO., Cleveland. He succeeds E. F. Vidro, who has retired.

George L. Bachner, appointed general manager, New Powdered Metal Products Div., THE YALE & TOWNE MANUFACTURING CO.

John S. Carr, appointed manager of pump sales, American Manganese Steel Div., AMERICAN BRAKE SHOE CO.

LEWIS M. PARSONS, vice-president, Washington, D. C., U. S. Steel Corp., will have extended responsibilities in Philadelphia area also.

WILLIAM RODGERS, elected vice-president and general sales manager, Blaw-Knox Co., Pittsburgh.

DONALD J. SHAUGHNESSY, appointed administrative assistant—Production & Scheduling at the Monessen & Allenport, Pa. works, Pittsburgh Steel Co.

Leo R. Bielecky, promoted to general chief clerk, Invoice & Freight Div., Accounting Dept., THE YOUNGSTOWN SHEET & TUBE CO., East Chicago, Ind.

John K. Deasy, named traffic manager, WEIRTON STEEL CO. He succeeds A. S. Earp, who has retired. **F. J. Walliser** and **H. E. Freas,** appointed assistant traffic managers.

James E. Butler, appointed manager of products sales, FRANKLIN BALMAR CORP., Baltimore.

Sidney H. Webster, appointed manager of the Northeastern district, JACK & HEINTZ, New York.

W. Alexander McCune, Jr., appointed general sales manager, NORTON CO. OF CANADA, LTD.

E. L. Argo, appointed assistant to manager sales, Bolt Products Div., Kansas City, SHEFFIELD STEEL CORP.

Bev Brower, appointed to newly created position of Advertising manager Asbestos Products, NATIONAL GYPSUM CO., Buffalo.

Dr. Bruce J. Miller, appointed, assistant manager, Research Administration, UNION CARBIDE & CARBON CORP., New York.

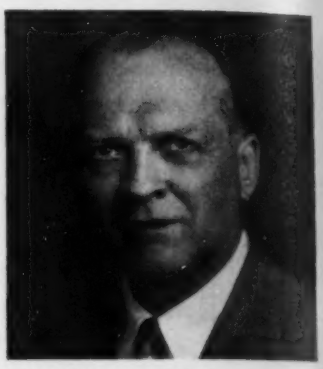
Henry A. Sturm, appointed manager, Boston Branch, CRUCIBLE STEEL COMPANY OF AMERICA; **Wilson E. Gardner,** becomes manager, New York Branch; **Alfred A. Companion,** named assistant manager, Boston Branch; and **Harold Barlow** will become special sales consultant to the New York Branch.

John F. Curd, appointed district manager, Cincinnati District Office, STERLING ELECTRIC MOTORS, INC., Los Angeles.

V. L. Nicoli, appointed superintendent, Wire Mill Buffalo Plant, THE COLORADO FUEL & IRON CORP., Wickwire Spencer Div.

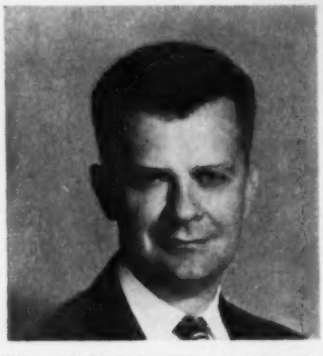
J. B. Trigg, promoted to sales manager, Buffalo Branch of CHASE BAG CO.

Jesse C. McKean, appointed director of training, WESTINGHOUSE ELECTRIC CORP., Industrial Relations Dept., Pittsburgh.

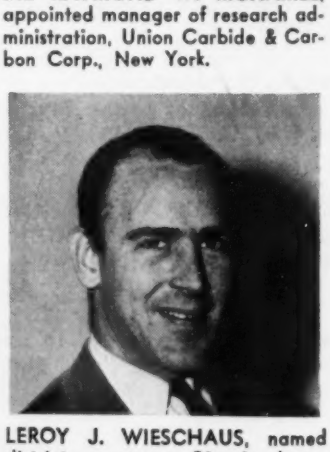


WILLIAM M. FRAME, appointed director of research and technology, U. S. Steel Corp., Pittsburgh.

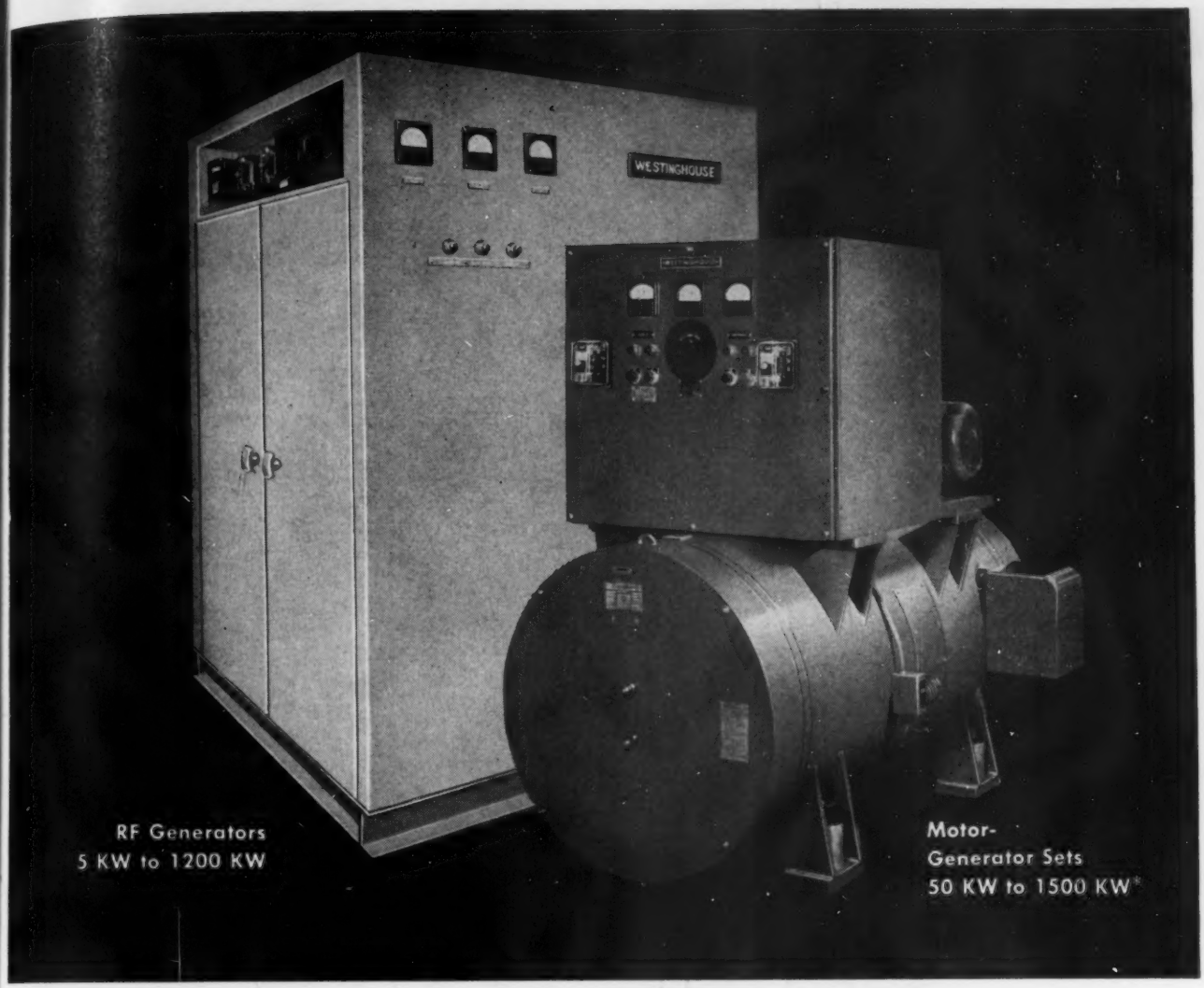
JAMES G. DECKERT, appointed secretary and a member of the board, Pivot Punch & Die Corp.



DR. RAYMOND W. MCNAMEE, appointed manager of research administration, Union Carbide & Carbon Corp., New York.



LEROY J. WIESCHAUS, named district manager, Birmingham, American Wheelabrator & Equipt. Co.



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J-02271

YOU CAN BE SURE...IF IT'S

Westinghouse

—Personnel—

Continued

L. E. Petzinger has been appointed field engineer, northern Ohio, LIVINGSTONE ENGINEERING CO., Worcester, Mass.

Robert S. Williams, has been appointed assistant sales manager, INDUSTRIAL FILTRATION CO., Lebanon, Ind.

David J. Jay, becomes engineer, Product and Process Development Section, Carboloy Dept., GENERAL ELECTRIC CO., Detroit.

A. S. Birchett, appointed traffic manager, WABASH RAILROAD CO., Traffic Dept.

J. A. Ritt, appointed field sales representative new Duluth sales office, RELIANCE ELECTRIC & ENGINEERING CO.

E. Austin Scholin, appointed bearing representative, THE KAYDON ENGINEERING CORP., Muskegon, Mich.

John L. Miller, appointed special sales representative, Williston Basin, The Columbia Powder Co., a subsidiary of OLIN INDUSTRIES, INC.

William S. Hammel, appointed Chicago district sales representative, Axle Div., EATON MFG. CO.

OBITUARIES

Thomas J. Lopiccolo, president, American Research Corp., Bristol, Conn.

John O. Larson, 39, director and executive vice-president, Fischer & Potter Co., Hatboro, Pa.

John W. Sheperdson, 74, retired executive vice-president Morgan Construction Co. at his home recently.

Herbert A. Gottschalk, 56, sales management executive, Kearney & Trecker Corp., Milwaukee, after a short illness.

H. N. Nelson, 43, assistant sales manager, Findlay Div., Gar Wood Industries, Wayne, Mich.

The Iron Age
FOUNDED 1855
Technical Articles

Cleaner operation—

Better Protection, Lower Packaging Costs With VPI WRAPPING

By E. J. Smith
Manager
Materials Handling Div.
American Blower Corp.
Detroit.

◆ Protection of finish-machined shafts is afforded by the use of vapor protective wrapping paper . . . Handling costs have been reduced and many manhours saved.

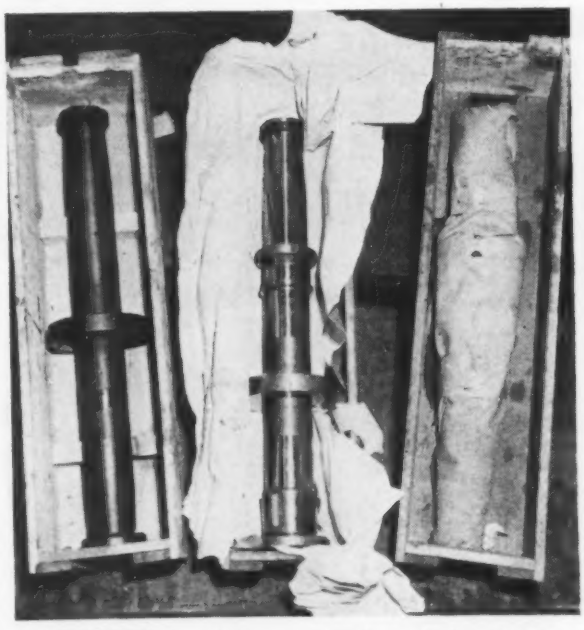
◆ This type of preservative is used by American Blower Corp., for large and small shafts . . . VPI paper is used for internal storage, domestic and foreign shipments . . . Elimination of cleaning more than pays the cost of the protective paper.

◆ TO PROVIDE completely reliable protection of hundreds of machined and ground shafts for fans and Gyrol fluid drives required each year by the American Blower Corp., Detroit, a decision was reached early in 1951 to substitute VPI protective wrapping for spray coating of shafts.

The decision was made after a careful study of all of the factors involved. These factors included handling costs, expense of removing protective grease, man-hr required to spray and remove protective coatings, and damage to shafts in the plant, in transit or on the customer's premises.

A recent study shows that the use of VPI protective wrappings, with or without light spray coating, has been more than justified.

Studies showed that unnecessary handling was involved in trying to protect the accurately finished surfaces of American Blower shafts by spraying. The fact that the shafts ranged in size from a few pounds to giant shafts nearly 24 ft long added weight to the argument that the elimination of unnecessary handling would be reflected in substantial cost savings. Other potential gains included elimination of cleaning



METHODS used for protecting shafts during storage or for shipment to customers. Sprayed shaft is at the left. VPI wrapped shaft is shown at the right.

Tough paper barrier protects shafts against corrosion, dirt and physical damage . . .

expense and greater production per sq ft of floor space.

Prior to the adoption of VPI protection, finish-machined and ground shafts had to be moved 400 ft across the Detroit plant in order to be set up on skids for spraying over the entire surface. The shafts were next placed in storage or shipped to domestic or foreign customers.

All shafts, regardless of size, are packed in wooden boxes. More than one small shaft can be packed in a single box. However, all large shafts are boxed individually.

Since the adoption of VPI protection all finished shafts going to internal storage are immediately wrapped in VPI paper, boxed and transferred to storage or shipping. When required for use, the shafts are unwrapped and assembled in the blower and fluid drive equipment. The lag previously required while the shaft was cleaned with a solvent has been entirely eliminated.

While it has not been possible to eliminate spray protection entirely, a light spray coating offers adequate protection against accidental damage during shipment. This gives double protection to the customer with the addition of the heavy VPI wrapping. Shafts are now being protected against any kind of atmosphere, inside or outside, at any point on the globe. There have been no complaints from customers that shaft protection was inadequate.

Two VPI papers used by American Blower are Angier Brownskin and the lighter grade, Barrier Wrap Crepe. Papers are purchased in rolls up to 36 in. wide from Whitfield Chemical Co.

After measuring, sufficient paper is cut to cover the shaft, including overlap at the ends. Pressure tape is used to hold the package together securely. A single wrapping is all that is required.

The lighter paper is used for shafts taken out of storage and assembled at the Detroit plant. The heavier Barrier wrap is used on all shipments to customers, whether foreogn or domestic. All shafts are placed in wooden boxes, whether for internal use or for shipment to customers.

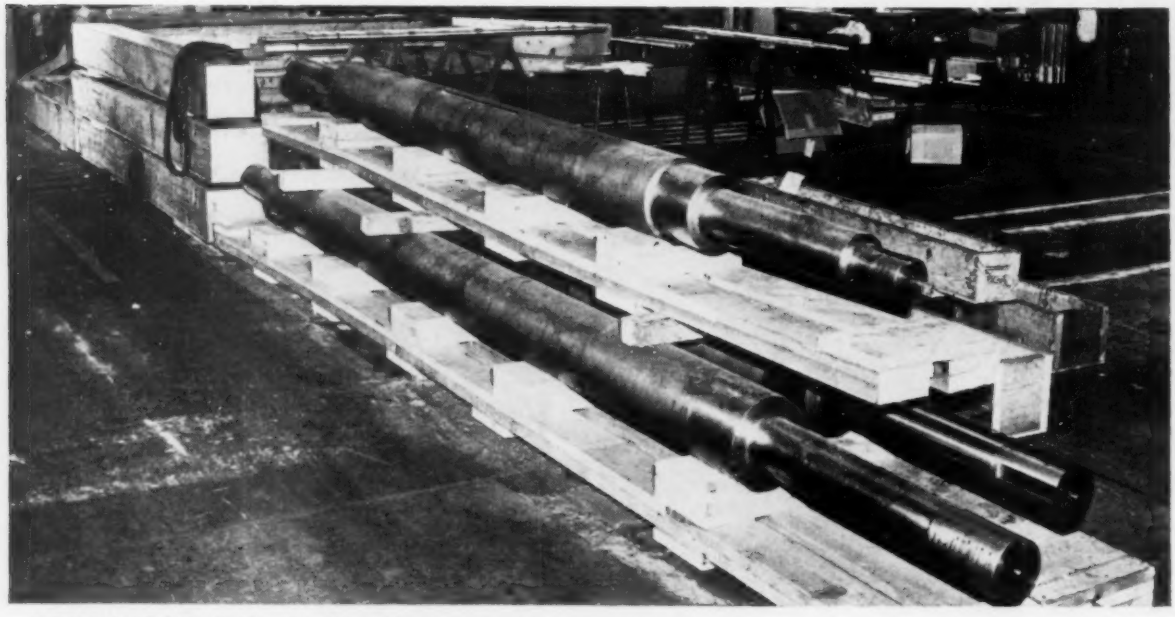
Gives longtime protection

The tough paper barrier protects the shafts against corrosion, dirt and physical damage for an extended period of time. Experience at the Detroit plant shows that shafts placed in storage without a spray coating remain in excellent condition after more than two years. Reports from the field indicate that adequate protection can be counted on, even out-of-doors, for at least a year.

There are many indications that nearly complete protection can be expected indoors indefinitely. Packages can be opened for inspection. If

Advantages of VPI Protection

1. Reduced handling cost
2. No cleaning expense required on the job.
3. Improved protection and preservation.
4. Cleaner operations.
5. Greater production per sq ft of floor space.
6. Reduced damage in shipment.
7. Faster assembly of equipment.



VERY LARGE shafts finish-machined to close tolerances are produced regularly at plant of American Blower Corp. Pressure tape is used to hold the package together securely.

the exposure time is not prolonged, the package can be closed again without requiring new paper covering.

Angier protective VPI paper protects against both oxidation and moisture. The paper is tough; it won't tear easily and packages remain securely closed. Packages remain intact in the shipping boxes even after rough handling during shipment.

Since the adoption of VPI protection, American Blower has been wrapping finish-machined shafts immediately and storing them in the area adjacent to the machine shop, thus eliminating the large amount of handling which was required when the spray protection process was used.

Direct and indirect savings

In addition to more efficient handling, elimination of cleaning expense and better protection against damage, adoption of VPI protection has made for a cleaner operation. At least 1000 man-hr—and the actual direct labor saving may be as much as 1500 hr—have been eliminated annually, by the use of VPI protection. Indirect savings in the form of greater production per sq ft of floor space, reduced expense of storage and handling, decreased cost of spray materials and equipment and faster turnover cannot be readily evaluated.

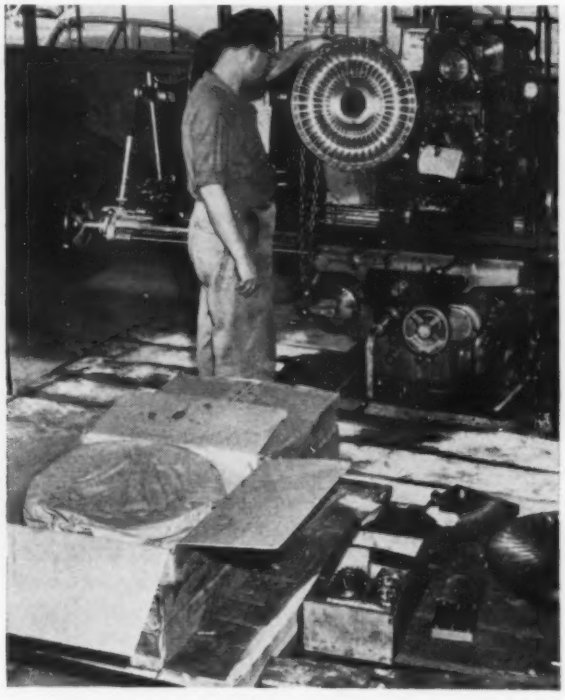
As a rule of thumb, it can be expected that the cost of spraying offsets the cost of VPI paper used to protect the shafts. Cost of the lighter Barrier Wrap is $0.1293 per sq yd. Cost of the heavier Brownskin wrap is $0.2587 per sq yd.

Reports received from customers describing the condition of shafts received in the field have been most encouraging. The possibility that bearing areas on shafts waiting to be fitted to bearings may be protected locally with VPI has been considered. This, again, would avoid a cleaning operation that is now necessary.

VPI materials are covered by military specifications under MIL P-3420. VPI protection has been accepted by a number of the company's armed services customers. Aluminum Gyrol fluid drive equipment furnished to the Navy is now being protected by VPI Barrier Wrap in storage, prior and during machining operations and for final shipment.

BROWNSKIN wrapping material is easily handled and readily applied to large shafts such as those shown above.

LARGE quantities of protected machined parts must be kept on hand to meet the requirements of customers.



PART protected by Barrier wrap is in the foreground. The protected parts can be placed directly on the machine.

Seen in profile—

ANALYSIS METHOD Helps Management Solve Personnel Problems

By W. B. Olson
Associate Editor

◆ A disarmingly simple analysis method is giving management more of the answers it needs in problems involving personnel. . . . Known as Activity Vector Analysis, the method yields remarkably revealing personality profiles for use in evaluating capacity and potential of both new and established personnel.

◆ Designed to supplement data from application blanks, interviews and intelligence and aptitude tests, the method indicates probable behavior in a given work situation. . . . It indicates the amount of energy a person will be able to apply to his job.

◆ By evaluating jobs in terms of personality needs—aggressiveness, emotional adjustment, sociability, social adaptability—the method has demonstrated advantages in management development programs and in selection of all personnel. . . . Management is better prepared to meet problems of production, safety, health, handling of responsibility.

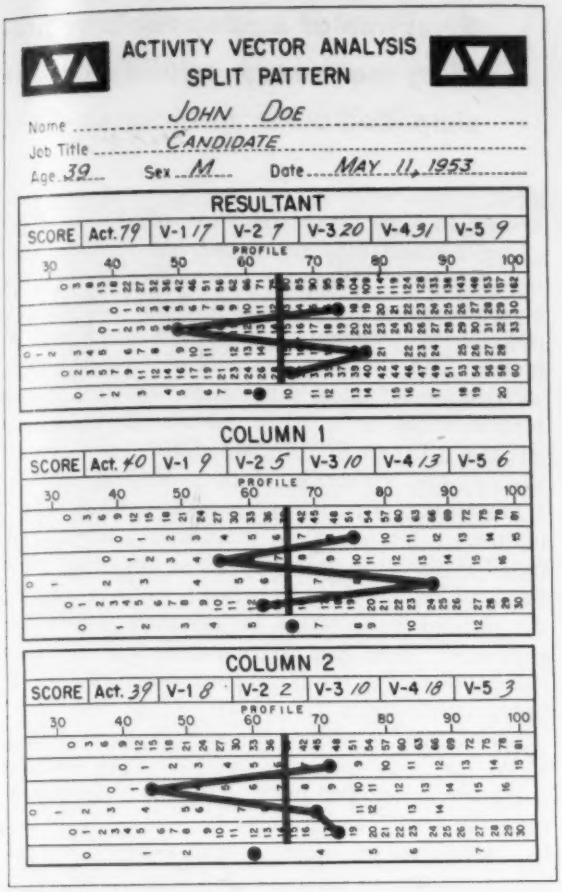
◆ FACING EVERY EXECUTIVE charged with the responsibility of hiring are two basic questions: (1) Can the man he finds *do* the job? (2) *Does he want* to do the job strongly enough to make good? The first question can be largely answered through data from application blanks, interviews, tests of intelligence, aptitudes and skills, and from observation.

Many companies have successfully applied an analysis tool, Activity Vector Analysis, to quickly, and at low cost, obtain answers. More important, these answers are available in advance of employment—at the important point of least investment in the individual. Accurate predictions on a series of related shop problems can also be supplied.

The method makes four assumptions:

1. Human behavior is dynamic, has direction and magnitude, and may be considered a vector.
2. Four areas of activity have been postulated: aggressiveness, sociability, emotional adjustment, and social adaptability.
3. If the four basic behavior vectors are measured, the resulting vector measurements, properly integrated, will reflect the behavior tendencies in any given situation.
4. Average magnitude of the four vectors will tend to indicate the amount of energy or vitality the individual has and can apply in the direction of his needs.

The analysis, a simple check list in which there are no right or wrong answers, consists of 81 nonderogatory descriptive words (go-getter, stubborn, adaptable, open minded). It can be com-



TYPICAL PROFILE obtained from scoring of analysis check list. "Test" can be given to any number of persons at one time, and requires about 15 minutes to complete.

WHERE ANALYSIS CAN HELP

1. PERSONNEL SELECTION—Turns up enlightening information about applicants when given prior to interview.

2. MANAGEMENT DEVELOPMENT — Reveals capacity and ability to handle responsibility.

3. ORGANIZATION ANALYSIS—Helps align various temperaments to effect smooth inter-personal relationships.

4. MOTIVATION—Suggests most effective methods to motivate individuals of different temperaments.

5. JOB ANALYSIS—Any job can be written up in terms of activity and the four vectors. Makes it easier to match the individual to the job.

6. PREDICTION OF OUTPUT—Indicates individuals who will produce more on the job.

7. EMPLOYEE MORALE—Helps employees feel the company is interested in them as individuals.

8. SALES AND CUSTOMER RELATIONS—Can indicate how a salesman will probably get along with customers, and his probable sales volume.

9. SAFETY AND ACCIDENT PREVENTION—Matches individual temperament with the temperament required in the job, making possible a reduction in accidents.

pleted in about 10 minutes. The person being analyzed first checks off every word he believes has ever been used by anyone in describing him. Next he checks off every word he believes descriptive of himself. Selective stencils are used to sum up the responses. The data is plotted on a special form to give a graphic picture of a behavior pattern. From this "profile" a trained analyst can predict the subject's *probable* behavior in a given job situation.

The analysis does not directly measure intelligence, dexterity or aptitude. But it does supplement data from the usual tests, interviews, application blanks and from observation.

The analysis helps determine in advance whether an individual is a good job risk. It shows his tendency to demonstrate initiative, drive, persistence, accuracy, leadership, patience and other personality characteristics related to job success. Probable levels of success can be indicated. By adapting the method to management problems—prediction of output, safety and health, management development—industry has an important tool in assessing an individual's capabilities.

To apply the method an analyst is needed. Usually he is a member of management trained by Walter V. Clarke who developed the method. The analyst should be thoroughly familiar with the skill and aptitude requirements for a specific job, and with established company standards. He should know the temperament requirements for a specific job. Characteristics of temperament in the individual as revealed by analysis, can then be related to the known characteristics of the job.

Only restriction on the placement analysis form is that the person be over 16 years old. In interpreting results, data from all four vectors must be integrated Evasive answers, easily recognized, usually result in an overemphasized pattern of the individual's normal profile.

In developing the method, differences or resemblances between personality patterns of many people successful at many different jobs were sought. Slight differences in personality pattern

TABLE I

SPLIT-HALF RELIABILITY
on 100 cases

Act.	0.97 ± .02
V-1	0.95 ± .02
V-2	0.94 ± .02
V-3	0.92 ± .02
V-4	0.95 ± .02

TABLE II

TEST-RETEST RELIABILITY
on 323 cases

Act.	0.75 ± .03
V-1	0.73 ± .03
V-2	0.72 ± .03
V-3	0.62 ± .03
V-4	0.71 ± .03

were found to exist between presidents and executives, including vice-presidents, general managers, works managers, etc. But marked differences were found between presidents and the other groups such as accountants, engineers, teachers, machine operators. Where a significant difference is not found, there are similarities between jobs which justify this lack of difference.

Among the first to try the new and radically different method was Continental Screw Co. of New Bedford, Mass. Since the first installation at Continental Screw, the program has gradually gained momentum in the fields of banking, insurance, utilities, retailing and distribution as well as manufacturing.

Bachmann-Uxbridge Worsted Corp., Uxbridge, Mass., successfully applied the method across-the-board. Now no one—salesman, designer, loom fixer, inspector or mill hand—is hired without first taking the analysis. Both management and employee benefit from use of the tool. It

TABLE III

STABILITY ON REPETITIVE WORK
Predictions vs. Company Ratings
Repetitive Machine Operation

		Selection Based on V-3*		
		Low	High	Total
Company Rating	Good	19	37	56
	Poor	15	2	17
	Total	34	39	73

* Vector for emotional stability.

TABLE IV

HOW GOOD AN OPERATOR
Prediction
vs.
Company Ratings

		Analysis Prediction		
		Poor	Good	Total
Company Rating	Good	31	25	56
	Poor	17	0	17
	Total	48	25	73

TABLE V

PREDICTION OF ACCIDENTS
VS.
HOSPITAL RECORDS

		Analysis Prediction		
		Accident	Non-accident	Total
Hospital Records	Non-accident	27	18	45
	Accident	21	7	28
	Total	48	25	73

TABLE VI

PREDICTION OF DISCHARGE

	Analysis Prediction		
	Poor	Good	Total
Satisfactory	31	23	54
Discharged	17	2	19
Total	48	25	73

Selection of men capable of handling more responsibility can be simplified . . .

brings to light characteristics which the individual himself may not recognize. Understanding developed through interpretation of the analysis makes for better adjustment of the employee to the company and gives management an insight into the best methods of handling him.

Selection of men capable of handling more responsibility is a basic motive in using the method. Trumbull Electric Dept. of General Electric Co., Plainville, Conn., found the method a practical tool in its management development program. Norton Co., Worcester, Mass., has found it valuable in organization analysis. New England Mutual Life Insurance Co. has applied the method to selection of salesmen and office personnel. More than 90 companies have successfully applied the method in solving problems of human relations.

Reliability for each of the vectors, on each half of the test, was computed for 100 cases, selected at random from 5000 tests. Product-moment correlations are shown in Table I.

A temperament measurement analysis should reflect changes in behavior at different times and under different conditions. The analysis is designed to measure behavior characteristics of the individual in or seeking employment in business or industry. The normal individual in this group has a relatively stable basic behavior pattern. Any wide variability in his basic pattern is usually the reaction to some strong environmental stress. While the analysis does indicate abnormal behavior tendencies, it was not designed to measure day-to-day fluctuations identified with deviant behavior.

Shows probable success

Due to the test's intentional simplicity the test-retest period should not be less than 6 months. Test-retest reliability was recently determined for 323 varied occupational cases. Product-moment correlations for the four basic vectors and the activity level are shown in Table II.

Test-retest reliability coefficients were higher than had been expected because of the obvious limitations, so far as personality tests are concerned. Higher correlation coefficients would indicate a relatively insensitive personality test.

In establishing general test validity, selection of standards for judgment is difficult due to their diversity. Ideal criteria should be based on the individual's behavior in his environment. Since this is seldom possible, a generalization must be made based on observations under the same or similar conditions.

Since the purpose of the analysis is to predict probable success of the individual in the work situation, criteria should be in terms of company

Accident proneness, work stability, ability to produce can be more accurately predicted . . .

established standards. These vary widely from one company to another. Some firms maintain very adequate records of individual performance. Others rely entirely on supervisory judgment. Results of studies made under these extremes of objectivity will vary considerably. It is essential therefore in judging validity in any study that the conditions under which the study was made, be considered.

A common method of validating industrial personality tests is to correlate test scores with supervisors' ratings. Judgments of success and failure in the industrial situation, although arbitrary, are often the basis of management's decisions as to whether any individual or measurement device is effective. Clinical personality instruments have been successfully validated against psychiatric opinion. Industrial personality tests may probably be validated against competent industrial supervisors' ratings, since both groups of judgment can be considered expert in their own sphere of competence and for their own use.

Another standard against which personality tests may be validated is production in terms of quantity or quality. This has the advantages of being uninfluenced by personal bias and of being stated numerically. While actual production figures have advantages as criteria, even these must be used with caution.

Although use of production figures or other easily objectified data as criteria is preferred, it has been necessary to use both subjective and objective standards, keeping in mind the limitations of each.

AVA's were given 65 menders in a large worsted mill in Massachusetts. These girls inspect finished cloth for loose ends and flaws and sew or weave the ends back into the cloth. The job, highly repetitive, requires extreme attention to detail, the ability to stick at a rather tedious operation, and a high degree of patience. From the tests it was possible to predict probable productivity for each girl. These predictions were compared with actual average piece rate earnings. A scale using 5 pct intervals was set up.

The product moment correlation, computed with actual average piece rate earnings for 3 months, was .72±.06.

A Midwest manufacturer of machines applied the method to prediction of success or failure on a lathe job. Of 508 applicants screened for employment between December 1951 and September 1952, 96 were employed full time. Analysis indicated 86 would probably be satisfactory operators. Ten were considered poor risks. At the time of the study, of the 10 predicted to be poor risks, 10 were definitely in that category, all having been terminated. Ten others rated good had been terminated, none, however, for cause.

Seventy-three machine operators were employed on jobs which, because of the high degree of repetitiveness, may be considered comparable. Analyses of these men were sorted into low and high groups on the basis of emotional stability which is controlling in work of a repetitive nature. A second sorting into good and poor operators was made on the basis of a rating made by supervisors on an employee progress rating form. Results are shown in Table III. However, when all vectors are taken into account, the relationship is as shown in Table IV.

ANALYST Paul Morgan of Morgan Construction Co., Worcester, Mass., makers of rolling mills, gives a personal interpretation of analysis pattern to company engineer.

Prediction related to experience

In a further study of this group, AVA predictions were compared with company accident records. The group was divided into an accident v. non-accident group and compared with previously made predictions. Results are shown in Table V.

Although the level of confidence is not as significant as in the previous studies, chances are 99 out of 100 that a significant difference does exist, and a positive relationship between the prediction and the actual results is suggested.

A similar study, Table VI, was made of those who were unsatisfactory as indicated by dischange for cause. Those not terminated were considered satisfactory, regardless of ratings. Again, a definite relationship between prediction and experience is indicated.

Of 25 cases which analysis predicted would be good, all were rated as good producers by the supervisor, although later two of these men were terminated for cause. Of 48 rated poor by AVA, 31 were considered good by the supervisors.

The above article is based in part on a talk by John P. Cleaver at the Annual Research Meeting, Meehanite Metal Corp., held in Cincinnati last year.

Don't scrap it—

ORGANIC FILLERS

Seal Defects in Metal Products

By Helmut Thielsch
Director, Applied Welding Engineering
Eutectic Welding Alloys Corp.
Flushing, N. Y.

◆ Two groups of organic fillers—one for sealing microdefects and the other for large defects—permits salvaging rejected cast and welded parts . . . Both groups have 100 pct solids content . . . One type, when heated to 300° to 450°F, becomes highly fluid . . . The other, at 400° to 500°F, is a workable paste.

◆ Materials, being thermosetting, harden fully and do not soften when reheated . . . Repaired areas can be machined by conventional processes . . . Color additives indicate degree of curing . . . Treated sections can be sandblasted, cleaned, painted or lacquered . . . Application is by rod, paste or powder form.

◆ REJECTION of defective cast and welded parts results in material losses and labor costs running into millions of dollars yearly. Many defects are large enough to be detected visually. Others in the form of microporosities are so small that detection is difficult. Regardless of their size, such defects can now be repaired effectively, quickly and economically using new organic filling materials.

Defects in many parts may be repaired by welding, brazing or soldering. However, heating of other parts may damage the material further. For example, thin or intricate aluminum or magnesium sections may develop new leaks due to excessive distortion or cracking. In other materials, such as certain diecasting alloys, repairs by welding or soldering are difficult or impossible.

Large voids or defects in heavy castings are often filled by welding. Cracks may have to be chamfered, chipped or ground out before welding. Grinding is usually necessary to smooth out the completed weld. Sometimes excessive machining or a design change requires filling in or building up a part. Although repairs by welding are generally good, welding may be undesirable because the material involved is not readily weldable, it may cause excessive distortion or cracking, or be too costly.

Use of filler materials can reduce losses due to rejection of parts or expensive repairs by welding. Microporosity in aluminum, magnesium or diecastings can be filled or closed up by impregnation with inorganic, organic or metallic materials. Water glass was one of the first sealants used. Recently, many organic resins have been marketed for sealing, most of which have a relatively low solids content.

A phenolic sealant with 50-pct content would loose about 50 pct in volume by evaporation and retain only the balance in the pores. Thus, a tight seal may not be obtained. For efficient sealing, sealants should contain a 100-pct solids content. Vacuum or pressure impregnating equipment has also been developed for forcing the sealant, either as a liquid or a fine disper-

sion, into the pores. However, such equipment is costly and cumbersome to operate.

A new procedure, using adhesive formulations has been developed by the ChemoTec Div., Eutectic Welding Alloys Corp. All materials have a 100-pct solids content and are based on special ethoxylene-resins made by Ciba Corp. These newest adhesives for metal bonding are thermosetting so that they cannot be softened by reheating once they have been fully hardened.

Some of these products contain varying amounts of metallic or inorganic fillers to provide special properties as color match, penetration, shrinkage and heat resistance, similar to those of the metals. Where microporosities and fine cracks are to be sealed, the amount of the fillers present is kept relatively low. Where large defects are to be filled, the filler content may be as high as 80 pct. Major characteristics of the materials used for filling microdefects are listed in Table I.

Defective areas to be impregnated should first be thoroughly cleaned and degreased. The part should then be heated to about 300° to 450°F if low-temperature heating or drying ovens are available, and if the defective part is of a size suitable for oven heating.

After removal from the oven, the filler material is applied to the defective surface area. Upon application to the heated part, these materials immediately become liquids of high fluid-

TABLE I

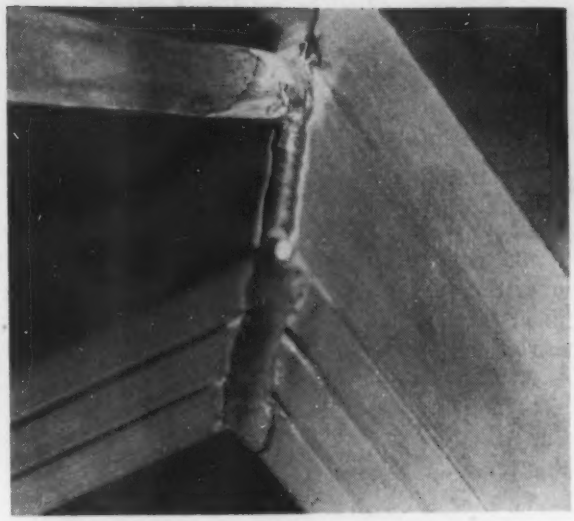
FILLERS FOR MICRODEFECTS

ChemoTec No.	Form	Color or Nature	Application
720	Rod	Opaque	Sealing microporosity, very fine cracks and leaks.
700	Rod	Aluminum	Sealing porosity, fine cracks, and leaks where color match to aluminum or magnesium is desirable.
730	Rod	Color changer	Sealing very fine microporosity, cracks and leaks, torch applications.
722	Paste	Opaque	Highest fluidity, for sealing extremely fine microporosity, cracks and leaks.
702	Paste	Aluminum	Sealing porosity, fine cracks and leaks where color match to aluminum or magnesium is desirable.
732	Paste	Color changer	Sealing very fine microporosity, cracks and leaks, torch applications.
721	Powder	Opaque	Sealing microporosity, very fine cracks and leaks, applied on horizontal surfaces.
702	Powder	Aluminum	Sealing porosity, fine cracks and leaks where color match to aluminum or magnesium is desirable, applied on horizontal surfaces.
731	Powder	Color changer	Sealing very fine microporosity, cracks and leaks, torch application on horizontal surfaces.

TABLE II

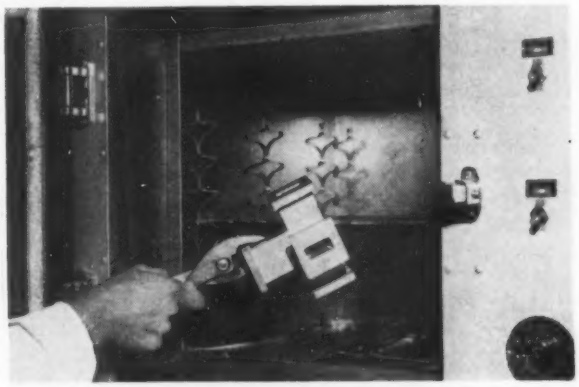
FILLERS FOR LARGE DEFECTS

FillAl No.	Form	Color	Application
744	Rod	Aluminum	Filling large defects in aluminum and magnesium castings.
740	Rod	Iron	Filling large defects in iron and steel castings.
7440	Powder	Aluminum	Filling large defects in aluminum and magnesium castings.
7400	Powder	Iron	Filling large defects in iron and steel castings.



WELD POROSITY in aluminum window frame is completely sealed with a paste filler. An oxy-acetylene torch was used for preheating to bring filler to high fluidity.

DAMPENER HOUSING gets curing treatment for several minutes after crack is sealed. A temperature of 500°F is maintained by indirect heating with a torch.



LOW-TEMPERATURE heating ovens bring small parts up to 300° to 450°F before filler material is applied. After sealing, parts are returned to oven for curing.

"Hardening is accompanied by a change in color to indicate the curing reaction of the resin . . ."

ity. Where rods are used, they are rubbed over the hot surface. Paste products are applied with a spatula or knife edge. Powders are sprinkled over the surface. The rod and paste may be ap plied in any position but the powders are for essentially horizontal surfaces.

After the filler has been applied, parts are returned to the oven and heated according to the following schedule to fully cure and harden the filler material.

Temperature, °F	Time
300	5 hr 00 min
325	2 hr 30 min
350	1 hr 30 min
375	1 hr 00 min
400	45 min
425	30 min

Where suitable ovens are not available or where the defective parts are too large for the oven chamber, other heating methods must be employed. The procedure usually used is to heat the defective area with a torch to about 400° to 500°F. Color changing rod, powder or paste can then be applied in the same manner.

At first the resin becomes highly liquid. As heat is applied to the area around the resin material, but not directly on it, the material will again harden. Hardening is accompanied by a change in color from a deep blue to a transparent pale green which indicates that the curing reaction is complete. The color changer incorporated in the resin is time-temperature dependent identical to the hardening cycle of the resin. At 500°F, the treatment requires only a few minutes.

NUMEROUS LEAKS in radar wave guide tubing are effectively sealed with ChemoTec 720 rod. About 90 pct of these rejected parts pass final rigid inspection after sealing.

Heating of the resin material to temperatures exceeding 550°F is undesirable. Therefore, heat should not be applied to any one area for too long. Excessive heating is indicated by smoking and blistering. Overcuring is indicated by a color change from apple green to brown. The color reverts to blue if the resin is heated insufficiently.

When the parts cool to room temperature, they can be processed further by sandblasting, solvent cleaning, painting or lacquering. Sealed parts can withstand the severest testing conditions.

Wave guides repaired

One firm making aluminum radar wave guides has numerous leaks in the welds in the wave guide tubing. Defective areas are sandblasted and heated at 300°F for 2 hr. Opaque materials Nos. 720 or 722 are then applied to the areas marked by the inspection department. The part is then placed in a second oven at 375°F for 1 to 2 hr. After removal from the oven and cooling, openings in the tube are sealed tight with rubber gaskets backed up by steel platelets. Internal air pressure of 25 psi is applied to the part through one of the platelets and the part immersed under water. Leaks, when present, are revealed by bubble formation.

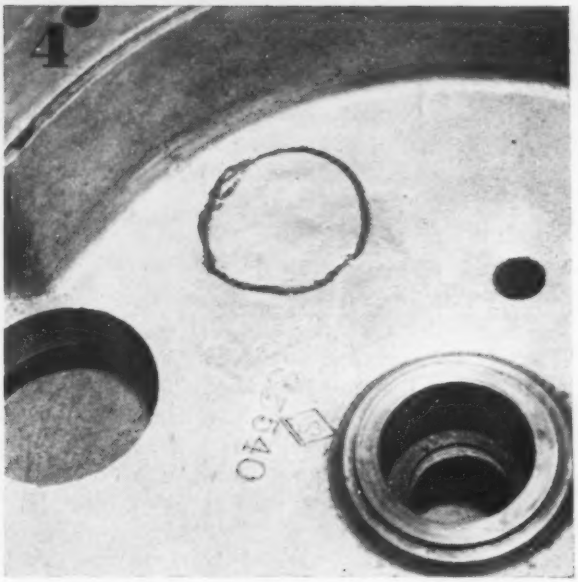
For final inspection, air pressure at 30 psi is applied to the part which, with all openings closed, is held for 24 hr at −110°F. Any pressure drop indicates leaks, some of which may not have shown up in the water immersion test. About 90 pct of the initially defective parts, upon impregnation with the fillers, pass this test proving the high flow characteristics of these materials.

Resins have many uses

Wave guide sections too large for oven heating are heated by torch. When temperatures of 400° to 500°F are reached, the color changing paste is applied over the defective area and allowed to liquefy. Heating is continued until the dark blue resin changes to an apple green color. Testing is done by the same procedure.

Other applications where these highly penetrating resins are used include cast engine blocks and heads, radiators, tube joints, pump housings, cast aluminum outboard motor housings and many others.

Large defective areas are filled with FillA1, a group of materials having filler content as high as 80 pct. These materials listed in Table II are not excessively free flowing and behave more like paste when heated above 300°F. This allows filling relatively large areas in a short time.



ALUMINUM CRANKCASE CASTING would have been another rejected part due to design change. Machined hole on inside is filled with FillA1 material, then packed and smoothened with spatula. After heating for a few minutes to cure it, followed by cooling and sanding, the repaired area is hardly visible and the casting is as good as new.

Heating large castings in an oven to 300° to 500°F is sometimes desirable but torch heating is generally more convenient and economical. With a torch, the defective area is heated to about 350° to 550°F. FillA1 rod or powder is then applied to the defect. At the proper temperature, the resin melts and the material becomes spreadable like a paste. Smoking indicates too high a temperature and the metal should be allowed to cool sufficiently.

While applying more heat to the metal in the vicinity of the joint, but not on the material, the paste is smeared into the defect with a spatula. It is smoothed by moving the spatula back and forth and adding more material as needed. The heating and smearing action is continued until the material has hardened. This requires a few minutes. Because of the high filler content, the material, once hardened, can withstand temperatures up to 700°F.

In addition to filling large casting defects and machined areas, these materials are also used with good success as a plastic-body type solder for automobile fenders. After hardening, the material may be sanded to a feather edge and painted. The adhesiveness of FillA1 is exceptionally good. It will not flip off when the fender is hit from the underside with the pointed tip of a hammer.

Repaired areas can be machined by the major machining processes. When grinding, the sander should be held lightly allowing the disc to do the work. Paints adhere to repaired areas extremely well.

AISE MEETING

STEEL OPERATORS SEE PRODUCTION SHIFT

- Engineers will offset volume loss by greater efficiency.
- Foreign competitors underselling on rods, wire, some tubing.
- Consumer will benefit by electric furnace-openhearth competition.
- New method for cleaning openhearth checkers with chemical solvent.
- Refractories developments affect furnace design.
- How to control blast furnace break-outs.
- Problems in handling foreign ores.

◆ SHIFT in emphasis from all-out steel production to greater efficiency and cost reduction confronted 2800 engineers as they met in Pittsburgh, Sept. 28-Oct. 1 at the 1953 annual convention of the Association of Iron and Steel Engineers.

The economic climate in the coming year, being more uncertain than at any time since 1949, pointed up importance of steel plant engineers in the task of increasing operating efficiency to offset loss of volume as conditions become more competitive.

Although the subject was not on the official agenda of the meeting, the economic outlook came in for more than casual discussion between technical sessions.

Foreign Competition

Two things seem to be worrying the engineers from a competitive standpoint: (1) competition among U. S. producers, and (2) competition from foreign producers. Of the two, the latter is in some respects the most threatening in the thinking of some observers.

U. S. mills already are feeling the sting of foreign competition on the East Coast. The overseas producers are said to be underselling U. S. mills on carbon rods ($10 per ton), nails ($2 per keg), barbed wire ($1.50-1.75 per bundle). Also, competition of a minor nature in seamless tubing.

Question uppermost in many minds is whether this foreign competition will grow to include "tonnage" products such as sheets and bars. Ironically, a large part of this steel is being produced on U. S.-made mills, some as efficient as modern equipment in this country, with the added advantage of cheap labor.

Some steel producers have warned of foreign competition. Latest is Admiral Ben Moreell, chairman of Jones & Laughlin Steel Corp., who cautioned Congress against further strengthening of the so-called European Coal and Steel Community. He likened American aid for this purpose to using U. S. tax money "to further build up competition which will materially impair the source of these revenues and will do great harm to investors in the American steel industry."

The growing controversy over electric furnaces v. open hearths for low carbon steel production attracted a large crowd to the session on electric furnaces. An interested though unseen spectator was the steel consumer, who will reap the benefit as open hearth and electric furnace advocates strive to lower their production costs.

Electric Furnace Forecast

Those who look for electric furnace capacity to grow at the expense of open hearth predicted a gradual infiltration by the electrics as mills replace open hearths with electric furnaces.

Usual arguments favoring one or the other of the two steelmaking methods were advanced by proponents.

In a paper discussing the future of large electric furnaces, F. W. Brooke, consultant, predicted that eventually five heats of electric furnace steel

Steel engineers meeting in Pittsburgh discuss future, present awards, elect officers.

will be made while two heats of comparable size are being made by the open hearth method.

The speaker discussed electric furnace steelmaking from its infancy, recalling advances that led to the method's present stature, including the change from side door to top charge, oxygen practice, and furnaces of larger capacity. Another factor, he said, was the great demand for high alloy steels during three wars—a demand that could not have been satisfied without the electric furnaces.

One of the most interesting predictions concerning electric furnaces was that of Willard C. Wheeler, consultant, who said that within the next quarter century electric furnace output of carbon steel will grow to 30 pct of total carbon steel ingots produced.

"Electric furnace carbon steel production is following the general pattern of many other processes and products which have been similarly analyzed," Mr. Wheeler said.

Wheeler based his prediction on the so-called Conkling method of economic forecasting under which a product's growth is charted in three distinct phases, (1) the development phase, (2) the surge phase, and (3) the growth phase. Electric carbon steels, he said, have already gone through the development and surge stages and are now entering the growth stage.

"The rate of increase in carbon steel ingots over the past 24 years, if projected to 1975, will mean a tonnage of about 162 million or 84 pct greater than current steel production," Wheeler said. He added that 43 million tons of the 1975 output will be electric furnace carbon steel ingots.

David D. Moore of Battelle Institute discussed the study made by Battelle for Bituminous Coal Research, Inc., and 14 electric utilities on the economics of electric furnaces v. open hearths (THE IRON AGE, Aug. 27, 1953, page 43). He concluded that production costs for electric furnaces are higher than equivalent-sized open hearths, but the lower capital investment permits an improved percentage return.

PRIZE WINNERS for outstanding papers written during 1952 are these four authors. Standing, l to r, J. L. Holmquist and A. F. Kritscher. Seated, E. H. Cauger and J. C. Stamm, Jr.

AISE MEETING

Tie In Technical Advances

William T. Hogan, S. J., professor of economics, Fordham University, highlighted the relationship between technological developments in the steel industry and advances in industries dependent on steel.

As examples, Father Hogan cited the development and growth of electrolytic tin plate and its effect on the canning industry. This was followed by development of differential-coated tin plate, which led to further economies in can making. Another example was development of so-called grain-oriented silicon steel and its impact on the electrical industry through consequent savings in steel, copper, and other materials in electric transformer manufacture, and more efficient electric motors.

Handling Foreign Ores

Problems involved in handling imported ores—a matter of more widespread interest in the industry as we grow more dependent on foreign ores—was discussed by E. M. Hays, of Dravo Corp.

Although some semi-automatic equipment is being used, much manual handling is necessary, Mr. Hays said. The railroads, he added, are installing modern equipment for handling ore after unloading from ocean vessels.

Trucks Dispatched by Radio

Use of fork trucks and straddle trucks in transporting and storing billets and pipe was discussed by J. D. Tyson of National Tube.

Mr. Tyson described a plan for assigning trucks by radiophone from a pool instead of the more commonly-used method of scheduled assignments.

New Way to Clean Checkers

In a discussion of cleaning techniques for open hearth checkers, J. J. Enochs and Reece Kincaid, both of Dowell, Inc., reported that a new method for cleaning checkers employs a chemical solvent directed into the checker chamber at 2500 psi through special jet nozzles.

The solution, according to the authors, disintegrates the deposit which is then forced into the tunnel by the downrushing air. Chemical cleaning is performed during operation of the furnace. No down time is required. The treatment is completed in two and one-half to 11 hours, depending on furnace size. Only a slight, temporary cooling of checkers results. Experience has indicated no measurable amount of spalling.

Value of the chemical cleaning method, according to the paper, may be assessed from the increase in tonnage, savings in refractory, and elimination of down time. One steel plant reports a savings of 48 hours down time and $15,000 worth of refractory per furnace. The tonnage output was raised from 22 tons per hr to 24 tons per hr.

Room for Expansion

A feature of Republic Steel Corp.'s new open hearth melt shop at Cleveland is a provision for increasing capacity of the four 275-ton furnaces to 300 tons at a later time, according to a paper delivered by E. C. McDonald, of Republic.

Furnace auxiliaries include instrumentation and control, waste heat boilers, materials handling, fans, reversing valves and flues, and the drained floor system under regenerators and flues. Operating results were described as gratifying.

Canadian Steel Grows

A large plant expansion program by Steel Co. of Canada to keep in step with Canadian growth was discussed by E. T. W. Bailey, of the Canadian company.

New facilities include docks, coke ovens, blast furnaces, and a new open hearth shop.

Blast Furnace Break-Outs

Blast furnace break-outs often occur at levels just below the original contour of the hearth, according to Prof. V. Paschkis in a paper on temperature distribution in blast furnace hearths.

The speaker said such break-outs may be attributed to the lack of freezing of the iron as it penetrates between joints of the lining.

A study by computational methods was undertaken to determine the freezing lines of iron in hearths of three different designs.

The depth of penetration of iron is governed to a considerable extent by the conductivity of the mass filling the region between the original contour and the freezing line, or "salamander space," according to Prof. Paschkis.

Assuming different values of conductivity of the mass filling the salamander space, the temperature distribution in the bottom of the furnace was determined. Based on the most probable assumption that the salamander space is filled with iron, carbon linings, especially side walls, appear superior to ceramic linings.

It appears that the best lining construction depends on the diameter of the furnace and all work carried out to date is limited to a furnace with a 28-ft. diam.

Refractories Aid Design

Some recent developments in refractories were reviewed in a paper by Hobart M. Kraner of Bethlehem Steel Co.

The raw materials and methods of manufacture of refractories have had a lot to do with present designs, according to Mr. Kraner.

Furnace practices developed over the years also placed certain limitations upon these refractories developments. The influence of war, requiring continuous furnace operation, the high cost of scrap, and the rapidly rising relining costs stimulated developments which would prolong lining life and cut down repair delays.

In the case of carbon, most Bethlehem people approached use of the material timidly, using it as a hot face lining, which was a mistake, Kraner said.

"Now we have come to realize," Kraner said, "that the high thermal conductivity of carbon is an asset of which advantage should be taken. We now put carbon against the shell of the furnace where it is exposed to cooling. Metal solidifies in the joints. Physical properties of several types of carbon are now known and carbon bricks are being tried. Results look attractive."

Prizewinning Papers

A highlight of the meeting was presentation of the AISE Kelly Award for the best papers in 1952.

First prize winner was J. L. Holmquist, director of research, Spang-Chalfant Div., National Supply Co., Ambridge, Pa. for his paper, "Investigation of the Piercing Process by Means of Model Wax Billets." Mr. Holmquist has been one of the pioneers in the operation of using wax billets in the laboratory to determine how metal flows in the tube piercing operation.

For their paper, "Operative Results of One-Way Fired Recuperative Soaking Pits," E. H. Cauger, chief combustion engineer, Wheeling Steel Corp., and J. C. Stamm, Jr., formerly of Wheeling Steel, now of Kaiser Steel Corp., won second prize. The paper described the new soaking pits installed by Wheeling Steel Corp. at its Steubenville plant.

Third prize went to A. F. Kritscher, of National Tube Div., U. S. Steel Corp., for his paper, "High Temperature—High Speed Heating." The paper described the application of the principles of high speed heating to new types of heating units which have given better production and economy in operations.

The award carries prizes of $300, $200, and $100 for first, second, and third place, respectively. It was established Sept. 28, 1943 to honor John F. Kelly, managing director of the AISE from 1917 to 1934, and to perpetuate the memory of his achievements in the advancement of the Association. The award is made each year by the board of directors of AISE.

NEW OFFICERS of Assn. of Iron and Steel Engineers will serve during coming year. They are (l to r) Eric L. Anderson, Bethlehem Steel Co., president; John H. Vohr, U. S. Steel Corp., first vice president; W. H. Collison, Great Lakes Steel Corp., second vice president; J. D. O'Roark, Weirton Steel Co., treasurer, and Leonard Larson, Republic Steel Corp., secretary.

Faster output—

FLEXIBLE TOOLING Handles Wide Variety of Parts

By J. B. Doll
Superintendent, Factory No. 28
Buick Motor Division
General Motors Corporation
Flint, Michigan

◆ Tooling innovations increase Buick's production of replacement parts. Drill press uses air cylinders to synchronize dial indexing of parts with spindle movement . . . Coining with carbide dies replaces grinding of camshaft spacer rings and increases output 4.5 times.

◆ Rapid broaching of flats on small cylindrical parts aided by automatic feeding and indexing . . . Air tools speed loading and unloading of threaded parts on arbors for OD grinding.

◆ HUNDREDS of different small parts for current and past models of Buick cars keep a large factory known as "No. 28," busy meeting production requirements of the Buick Motor Division, Flint, Mich. Although numerous jobs are run continuously, by far the largest number are changed frequently. Yet quantities, varying from small to large, must be handled efficiently. The department operates as a huge job shop and must devise flexible tooling to keep abreast of require ments.

Numerous small parts requiring fast drill press operations are handled through dial setups like that shown in Figs. 1 and 2. One such part is a special spare tire nut that comes from a screw machine and requires chamfering on the cut off end. The parts are dumped in an inclined box chute leading to a table level with a notched dial, Fig. 1. The dial is indexed by an air operated plunger which is synchronized with other air plungers arranged to feed and retract the chamfering drill in its spindle chuck.

As the notched dial revolves, it is loaded by hand from the chute table. As each nut is indexed into the chamfering station, Fig. 2, the plunger of an air cylinder clamps the work piece automatically while the drill feeds down to make its chamfering cut. An air jet blows chips away. When this cut is finished, the air plunger and drill retract and the dial indexes the next nut into chamfering position.

Finished parts continue around the dial until

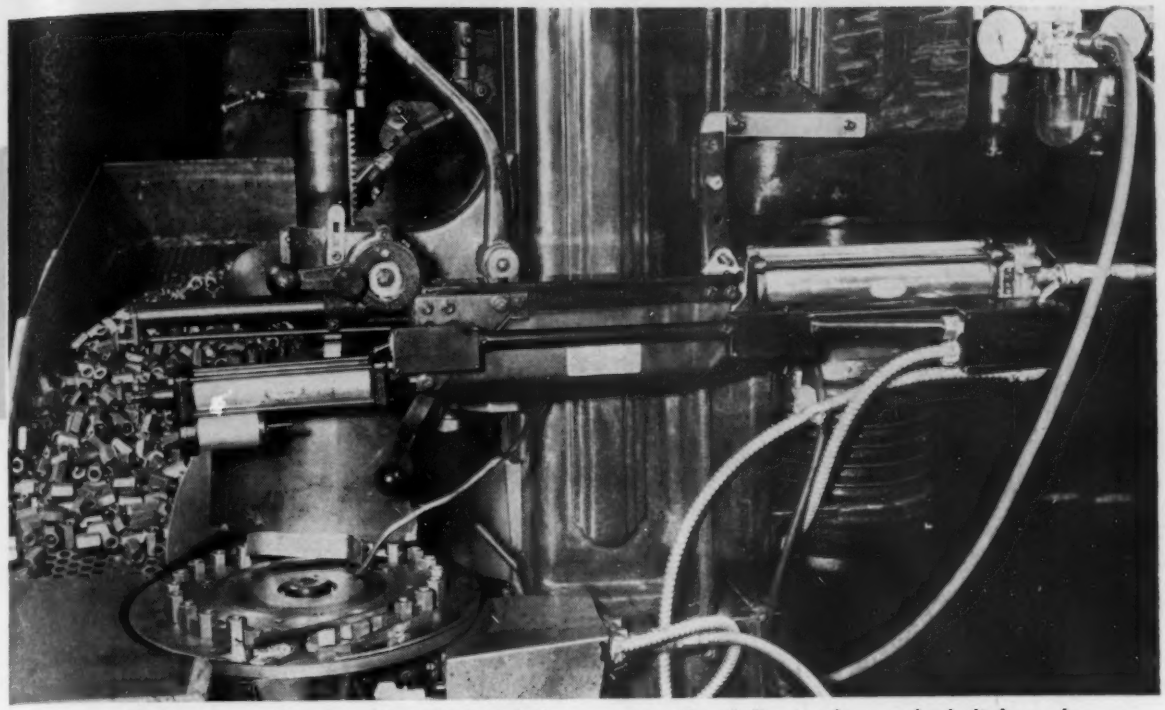


FIG. 1—Drill press with automatic indexing dial. Air cylinders control dial advance, also lower and raise the drill. As the notched dial revolves an operator hand loads it from chute table.

they drop into a chute shown in the left foreground of Fig. 1. About 1440 nuts an hour are handled by this method. Changing the setup to handle other parts requires only a few moments to switch the dial, clamp and cutting tool.

Camshaft spacer rings, formerly ground to a smooth finish on both faces at a rate of 400 per hr, are now coined to the same finish between flat carbide dies in an inclined press at the rate of 1800 per hr. The coining operation reduces the thickness by 0.003 to 0.004 in.

An automatic magazine and slide feed make the increased rate possible. As Fig. 3 shows, the magazine is merely a short length of tubing cut longitudinally and fastened in an inclined position to a slide which is operated by a cam attached to press ram. During each up stroke of the ram, a ring that has dropped from the magazine into a slide recess is advanced to coining position.

As the ram descends in its working stroke, the slide is retracted and the ring is left in proper position to be coined. A punch enters the ring hole to center the piece and to keep the hole from being reduced in size by the coining blow. On the up stroke, the coined ring is stripped from the punch and air ejected, dropping into a tote box back of the press. The carbide dies have long life, and being flat, their cost is moderate.

Fast broaching of flats on three different parts is done in a vertical broach setup, Fig. 4, which features a heavy, automatically indexing vertical disc. One of these parts is a short selector shaft which requires a flat broached at each end.

Parts to be broached are fed by hand into an inclined channel magazine and pushed, one at a time, by a reciprocating crosslide into hole near

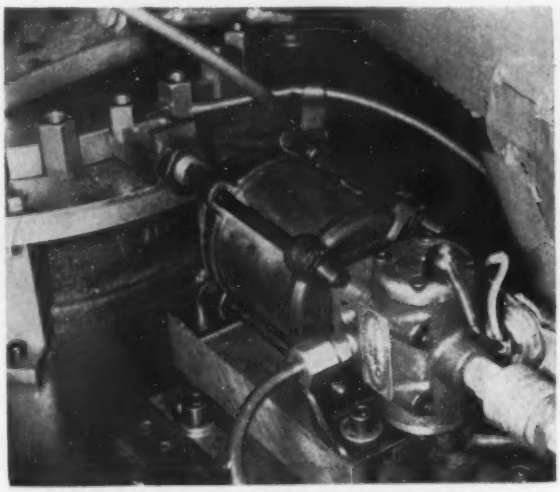


FIG. 2—Same dial as Fig. 1 with part in machining position securely held by a clamp attached to an air actuated cylinder.

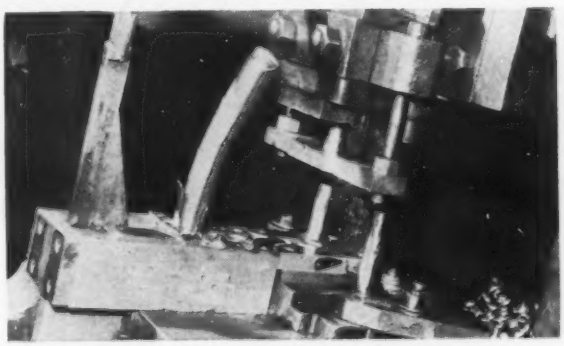


FIG. 3—Rings stacked in magazine, center, for coining to smooth finish and close tolerance. A slide below the magazine feeds rings to carbide dies in an inclined press.

After boring and tapping, special tooling expedites OD grinding of threaded drive shaft nuts . . .

the periphery of the disc. After this loading, the disc is indexed automatically 90 deg which brings the part to rest in broaching position, where it is clamped automatically.

Indexing is done with the broach up. After the work piece is clamped, the broach descends to make its cuts. The disc then indexes to clear and the next piece comes into position after the up stroke is completed. When broached parts reach the station above the chute, shown in Fig. 4, a plunger, operated by a lever attached to the loading slide, is rocked to push the broached part into the chute, leaving the hole open for reloading. Slide, indexing and clamping motions are positively synchronized with those of the broach and the machine runs automatically, only loading of the magazine being required of the operator.

Special tooling has also expedited the OD grinding of threaded drive shaft adjusting nuts after they have been bored and tapped. To insure a ground diameter concentric with the internal thread pitch diameter, each nut is screwed onto an arbor properly centered for the rough and finish grinding operations. After grinding, the nuts are unscrewed and the arbors reloaded. The air driven motors shown in Fig. 5 run the nuts on and off rapidly.

Extra arbors cut delays

One man loads an arbor by screwing on a nut, places the arbor on centers in a grinding back of him (not shown in Fig. 5) rough grinds the OD, removes the arbor from the grinder and passes it to a second man who places it in a second grinder for finishing. After the finish grind the second man unscrews the nut with his air tool, places the nut in a tote basket and passes the arbor back to his partner for use in the next cycle.

By use of extra arbors, all delays are avoided and both men, as well as both grinding machines are kept busy. This makes it possible to rough and finish grind 150 nuts an hour.

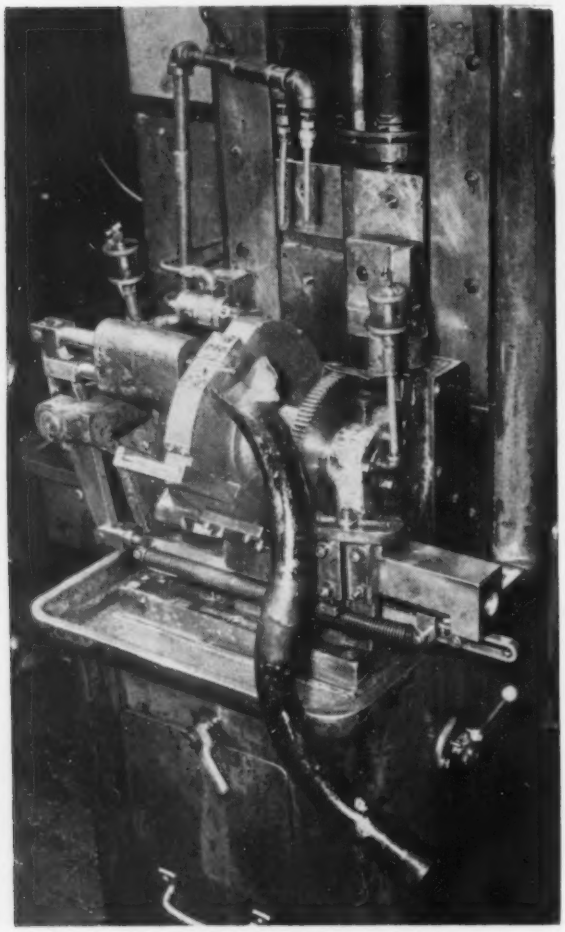


FIG. 4—Heavy dial fixture in vertical broaching machine is automatically loaded from a cross slide and indexed into position where work is clamped and broached.

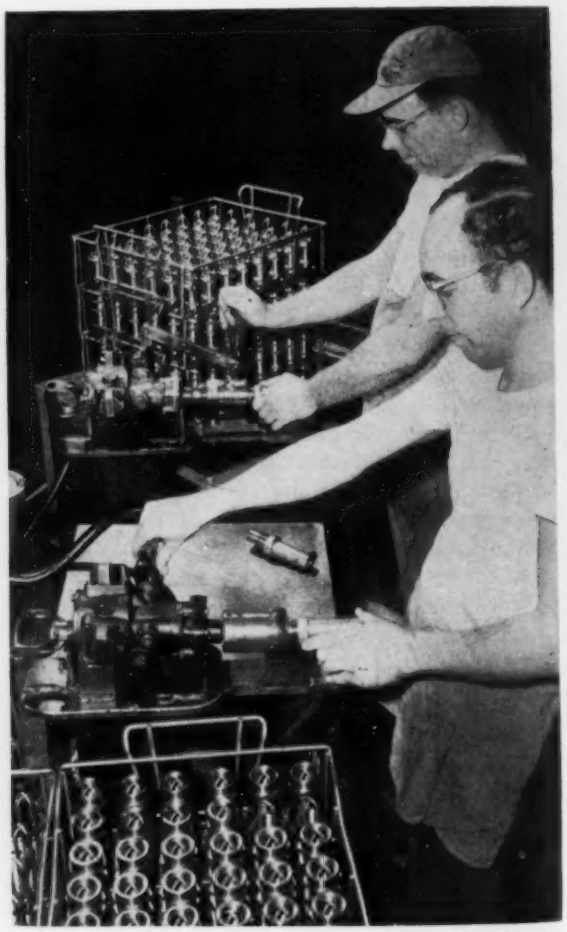
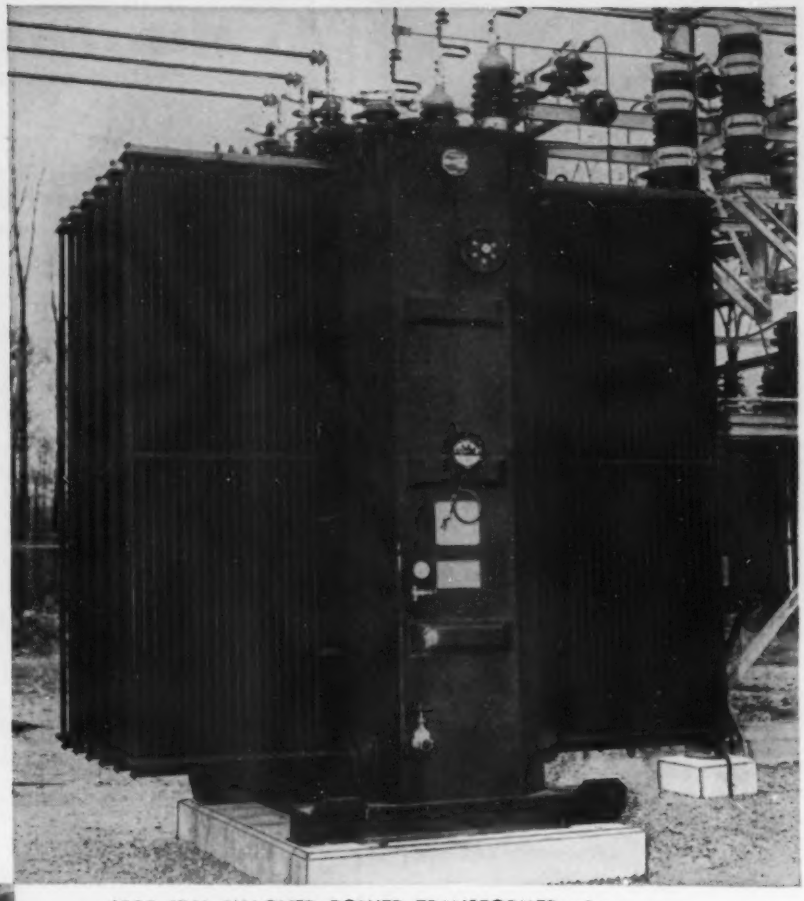


FIG. 5—Two man team uses air tools to load and unload threaded nuts on arbors for grinding OD. Rough and finish grind is completed on 150 parts per hr.

Wagner

Transformers used by Studebaker in new power distribution system planned for present and future needs



6000 KVA WAGNER POWER TRANSFORMER where power is received at 26.4 kv and is stepped down to 13.2 kv for distribution to the seven unit substations in the plant.

1000 KVA WAGNER UNIT SUBSTATION TRANSFORMER, at one of the five load centers that deliver 440 volt, three phase power to large machines and equipment.

New Jersey plant can convert from military to auto assembly production without extensive system changes!

The modern power distribution system at the Studebaker Corporation plant at New Brunswick, New Jersey has been planned with an eye to the future. While the plant is now manufacturing military jet engine parts, it will eventually become eastern auto assembly headquarters for Studebaker.

The power load is divided between seven load center substations, all equipped with Wagner Unit Substation Transformers, spaced 160 feet apart down the center of the building. In addition to insuring an adequate power supply for present purposes, this plan provides a dependable supply of power from short secondary feeders at any time in the future.

* * *

Why not discuss your next transformer installation with the Wagner engineer nearest you? There are Wagner branches in 32 principal cities. Bulletin TU-181 gives full information on Wagner Power Transformers, and Bulletins TU-13 and TU-56 tell about Wagner Unit Substation Transformers. Write for your copies.

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AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

T53-9

Technical Briefs

Engineering

PLATING:

Tough plating requirements bring wider use of automatic controls.

Automatic plating and metal finishing operations require more automatic control than any other high production item in industry today. Even the magnitude of the dimensions indicates to the average engineer problems that on non-destructive testing indicate statistical analysis and automatic operations.

The American Electroplaters Society's minimum specifications indicate nickel chromium on steel with type DS coating that the copper shall be 0.002 in., the nickel 0.0010 in., and the chromium to be 0.00001 in. thickness with a resistance to standard salt spray without appreciable corrosion of 96 hours.

Reaction Efficiency Varies

This typical specification is a minimum requirement; but we are dealing with several electro-chemical reactions which vary in efficiency under different temperatures, voltages, and states of solution.

A typical copper solution may vary from 25 amp per sq ft to 75 amp per sq foot with temperature change and agitation. Both automatic timing and temperature are necessary to meet such specifications. The control of the timing in any individual solution is a must when economy of operation is considered.

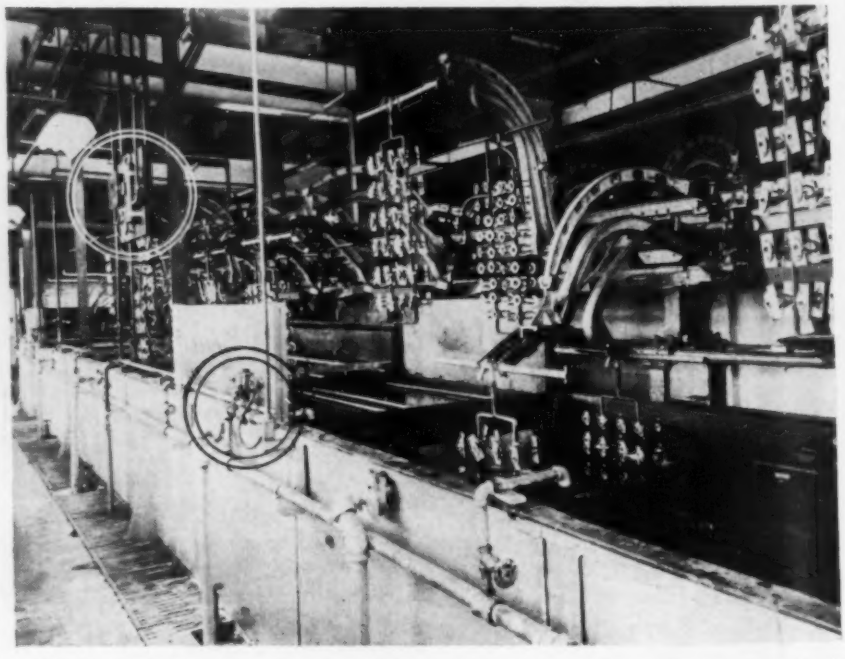
Time And Rinse Controls

The fully automatic timing control is illustrated in the accompanying photograph. In this particular panel special control timing of the operation of an individual arm is included, this is of course in addition to the control in the other tanks.

Where automatic control of spray rinse water is required, Frederic B. Stevens, Inc., installs solenoid valves that allow water to flow only during the time the rinse is re-

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 85. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



CLOSE CONTROL of automatic plating operation is maintained with the aid of automatic time and temperature controls. Other units control, rinse, timing, load.

quired at each individual station.

Precision plating of small parts demands that in fully automatic small parts plating and processing machines loading of the barrels must be identical to assure duplication of results. This is accomplished either through use of automatic weighing of the loads or the automatic time control of the feeder conveyor.

Cuts Labor Requirements

Time controls require minimum labor. One man can often operate two or more machines.

Automatic level control is furnished on heated tanks which replaces the water that is evaporated.

Automatic temperature is maintained by the use of heat exchangers. Chrome and anodizing solutions are cooled by an automatic refrigeration system connected to a temperature control unit.

CONSTRUCTION:

Aluminum pipe speeds laying of compressor air lines.

Contractors on the new $100 million West Virginia Turnpike are saving both time and labor in blasting and grading operations through use of lightweight aluminum pipe for compressed air lines.

The lightweight aluminum construction pipe is portable and couples easily. One or two workmen can rapidly lay a compresesd air line with the 20-ft sections of pipe which weigh only 15 lb each. Aluminum couplings used to join the pipe can be assembled in a few seconds.

Supplies Wagon Drills

This portability proved valuable in the rugged West Virginia Mountains for supplying compressed air to the wagon drills used in blasting and grading the new super-highway which will stretch 100 miles between Charleston and Princeton, W. Va.

Air is pumped into a 4-in. aluminum line using either three

Turn Page

or four 600 cfm diesel powered air compressors. These compressors operating together maintain a line pressure up to 130 psi in the aluminum line. The line is then tapped to run as many as six wagon drills at a time. The drills which cut holes into the mountainside for blasting operate on 120 psi air pressure.

Use Fast Couplings

Compressors are coupled with a threaded connection to a steel pipe section. The aluminum pipe line is in turn coupled to this steel section.

Pipe sections are joined together with either a sleeve type coupling or a new type rapid pin coupling.

The West Virginia Turnpike is expected to join with super-highways through Virginia and North Carolina. A northern link may some day connect it with the Pennsylvania Turnpike near Pittsburgh.

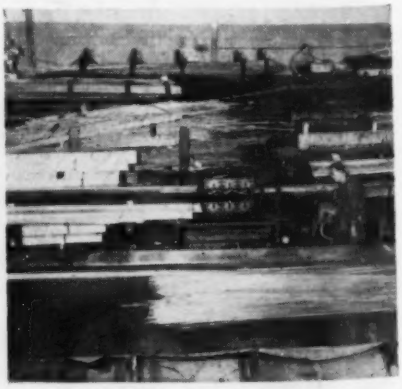
TUBE STRAIGHTENING:

Firm's new machine pays for itself in less than year.

A growing volume of redrawing business and critical straightness specifications on redrawn seamless copper tubing posed a dual production headache for the Cleveland plant of Viking Copper Tube Co.

Must Boost Production

Working with soft copper tube in diameters from ¼ to 1 in., and wall thickness from 0.020 to 0.065



HIGH SPEED machine straightens copper tubing, maintains roundness and specified temper. Tubes are delivered in finished lengths to shipping boxes.

in., the firm sought a solution in a study of production equipment that might step up volume while holding the tubing to specified straightness, roundness, temper and finish.

Twenty Pct Gain

Installation of a new Mackintosh-Hemphill rotary straightener proved to be the answer, according to Edwin C. Walter, vice president and general manager of Viking. Operating 16 hours a day for the past year, this new equipment has enabled Viking to meet all specifications.

Moreover, the new equipment will produce about 20 pct more pounds of tube per man-hour of work, straightening light wall tubing at the rate of 1,000 lbs per hr.

A variable speed drive is installed with the straightener. When hardening soft tube the machine is operated at about one-quarter of its 400 fpm rated speed; hard tube at 50 pct of rated speed.

The straightening operation is a one-man task. The operator sets up the machine with some assistance from the section foreman. The unit is claimed to hold its adjustment for "days on end" and a year's operation has been recorded with no maintenance investment.

Long And Short

Copper tube is straightened in lengths averaging 20 ft, but some straightening is done on 3 ft lengths. The machine's run-in is a wood trough, and a covered wooden "box" controls and whip in handling distorted lengths tubing.

A wood run-out table is sheathed with brass plates where surface finish is important. For less critical orders, steel sheets cover the brass plates. Lengths of straightened tube roll down the slight slope of the runout table, often directly into shipping boxes.

Ability of the machine to produce at a considerably higher rate than equipment previously used, and yet meet the exacting specifications for roundness and straightness have proved important factors in making the new installation pay off.

Turn Page

—Technical Briefs—

SERVO SYSTEMS:

New error voltage detector has many applications.

The trend toward automation in machines and processes calls for more precise automatic controls. Many of these are based on servo feedback systems that signal any deviation in a controlled device or process and institute prompt corrective action.

Detecting the error signal (usually a difference between two voltages) and correcting it calls for a method or device that is fast, flexible, accurate and reliable. One such device has recently been developed by the National Bureau of Standards.

Crystal Diodes Used

Utilizing crystal diodes in a bridge circuit, the device operates on the r-f chopper principle and shows a resolution to 1 millivolt with a bandwidth of at least 1 megacycle. A zero drift stability to 1 millivolt is readily attainable.

The new instrument is said to make a more rapid sampling of the output than a mechanical vibrator or chopper with its limited frequency and over-all response speed. The chopper principle, however, must be retained in order that the error detector may respond to d-c signals as well as a-c signals up to video frequencies.

To get a more rapid sampling rate, it was necessary to eliminate the mechanical parts and use electronic circuit elements. Best stability in an electronic circuit is usually obtained when only passive components are used in critical parts of the system. At present, the germanium diode appears to be the best passive chopper element.

High Sensitivity, Aim

Essentially, the NBS error-voltage detector is a bridge modulator with an r-f carrier as its source and the modulating signal as a dynamic controller of resistive balance. High sensitivity for signals near zero in amplitude is the primary aim, and nonlinear re-

Turn to Page 138

NEW!

ALL-PURPOSE VENTILATING SETS YOU CAN PUT INTO SERVICE FAST!

Direct-connected or V-belt drive
200 cfm to 15,000 cfm

Here's a new line of Westinghouse motor-driven ventilating sets. They are ideal for general purpose ventilation, for exhaust, for processes, and for removal of heat, fumes and vapor.

Where changing plant or building conditions create an unexpected need for ventilation, these sets are a quick solution. Here's why:

COMPACT SIZES—down to 10" x 12" x 16"—take little space, are easy to install.

SINGLE UNIT—fan, motor and drive all made and assembled by Westinghouse.

DIRECTION OF DISCHARGE—can be changed on the job.

LOW MAINTENANCE permits use of out-of-the-way locations.

WEATHERPROOF COVERS permit outside installation.

SHORT DELIVERIES get your job started sooner.

These ventilating sets are low in first cost, low in operating cost. You get a single warranty because fan and motor are both built by Westinghouse.

For other exclusive features and full information, ask for Catalog 1160. Call your local Westinghouse-Sturtevant office. Or, write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park 36, Massachusetts.

WESTINGHOUSE AIR HANDLING

J-80317

YOU CAN BE SURE ... IF IT'S Westinghouse

duction in sensitivity for signals departing from zero is convenient and desirable.

Two of the bridge arms are germanium diodes whose forward resistances are compared, the other two arms are inductors serving as r-f voltage sources for excitation of the diodes. Difficulty with contact potentials in germanium diodes is minimized by having the crystals operate at a high carrier voltage compared to the contact potential.

During half of the carrier cycle neither diode conducts and output is zero. During the other half-cycle output is still zero when the two diodes have the same forward resistance.

An error voltage applies a differential bias, unbalances these resistances, and causes a portion of the r-f carrier to appear at the output. Thus the error voltage causes partial half-wave rectification of the r-f source, and this output voltage itself contains a component at the r-f frequency which is amplified to serve as indication of the error-signal voltage.

Filters Are Protected

Mechanical details are important in the design and construction. Excellent shielding between input and output circuits is essential; a small leak from the r-f source will greatly reduce sensitivity.

Milling the main body of the transducer from a block of aluminum provides this shielding. A solid partition between the milled-out cavities reduces r-f leakage to a minimum, and thick walls furnish a heat sink for the two germanium diodes. Filters used in the circuit are well protected from stray fields of the bridge circuit, making it possible to set a good null balance and high sensitivity.

The transducer is not limited to a 30-megacycle carrier frequency. The general principle is readily adaptable to the use of an ultra high frequency carrier and will extend the bandwidth of the instrument if desired. If less bandwidth

Turn to Page 140

• *Standard steel's unsurpassed ability to produce weldless rings all the way up to 144" O.D. is one of SIX REASONS WHY YOU SHOULD ALWAYS CALL STANDARD STEEL FOR RINGS AND FLANGES:*

Weldless Rings from 12" O.D. to 144" O.D.

1. TESTING—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

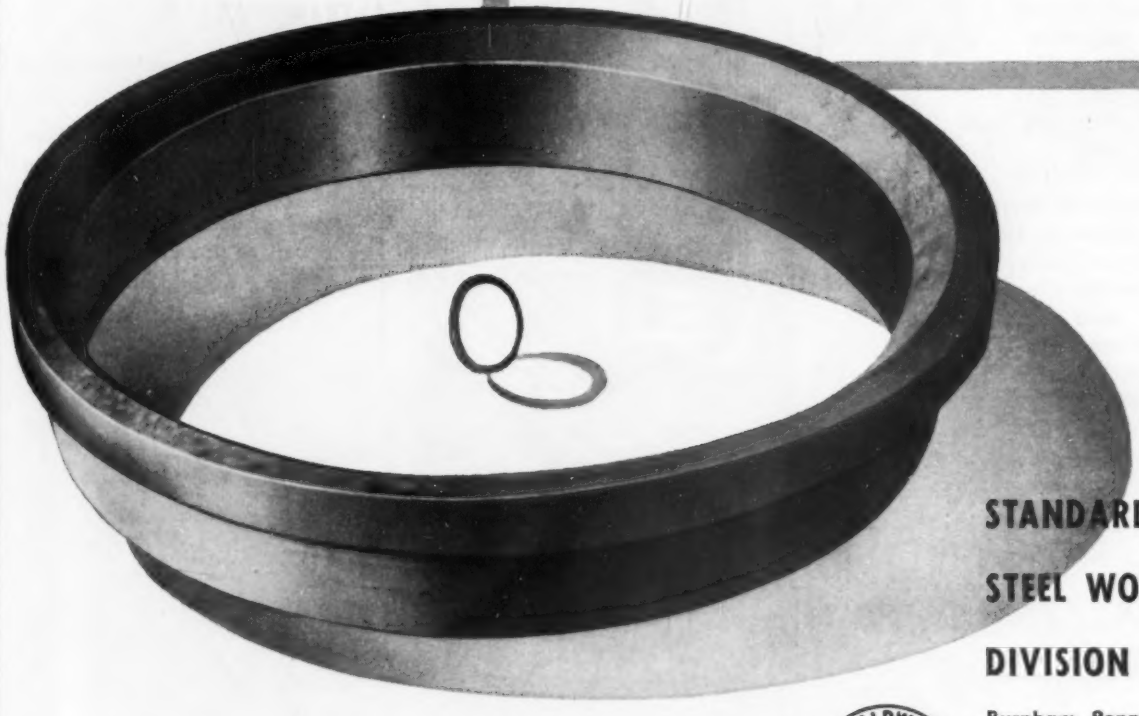
2. QUALITY STEEL—through production of own steel by the acid open hearth process.

3. UNIFORMITY—assured by precise control of forging and rolling operations.

4. CAPACITY—unsurpassed ability to produce weldless rings all the way up to 144" O.D.

5. EXPERIENCE—produced by skilled workmen with 20 to 40 years experience.

6. FAST SERVICE—a vital factor in the continuing growth of Standard Steel for over 150 years.



STANDARD STEEL WORKS DIVISION

Burnham, Pennsylvania

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is required, a lower-frequenc signal may be utilized wit economy of construction.

No Moving Contacts

The use of an r-f carrier in com bination with the transducer con taining only passive element makes multichannel operation un usually attractive with its com plete freedom from switchin transients.

One possible scheme involves rotating r-f link coupling betwee a number of transducers and single amplifier. All moving con tacts are avoided, and it is onl necessary to sample synchronous ly the amplifier output coincident with the positioning of the lin coupling.

This method of multichanne sampling permits the transduce units to be placed near the source of the signals to be amplified. I is quite practical then to provid coaxial cable connections from the numerous units to a commo point where r-f commutation int the amplifier is accomplished.

TRANSPORTATION:

Steelmill locomotive meets tough operating conditions.

Tough operating conditions in many steel mills, low headroom and tight clearances, pose special prob lems for designers of locomotives and rail equipment.

When a major steel mill recently

SPECIFICATIONS on this special steel mi locomotive called for narrow width, lo height, short wheelbase.

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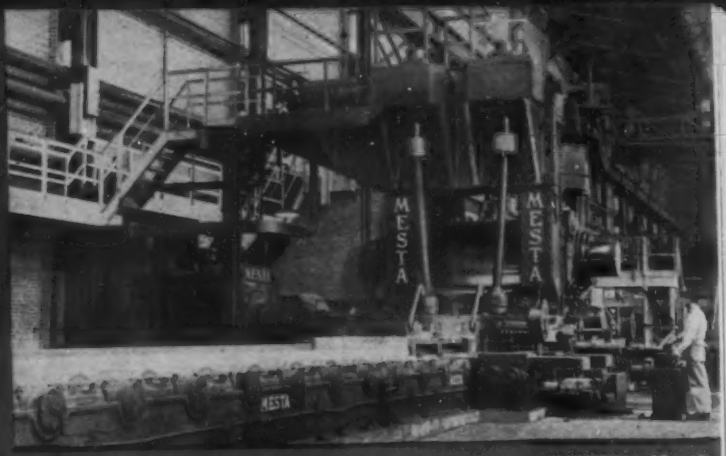
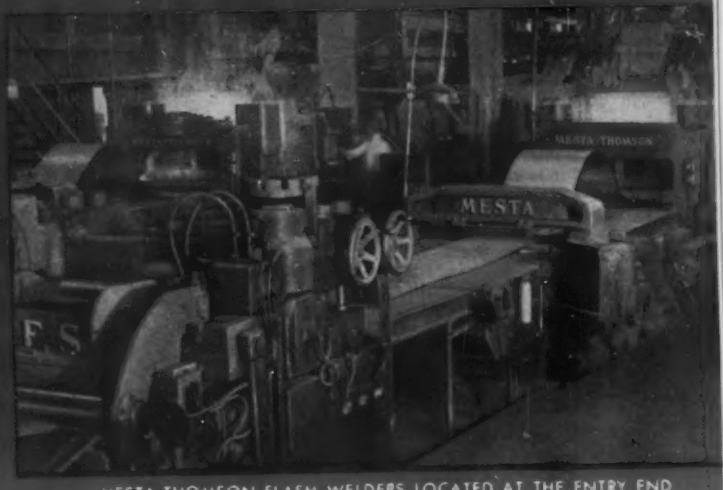
MESTA 110" FOUR-HIGH REVERSING PLATE MILL



MESTA 68" FOUR-HIGH CONTINUOUS HOT STRIP MILL, UNIVERSAL STAND

WORKING A HEAT OF HIGH QUALITY STEEL IN THE MESTA OPEN HEARTH DEPARTMENT

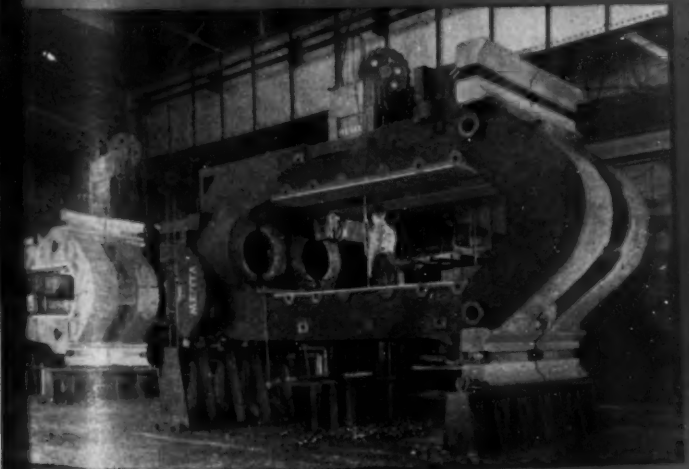


MESTA-THOMSON FLASH WELDERS LOCATED AT THE ENTRY END OF TWO MESTA CONTINUOUS PICKLING LINES

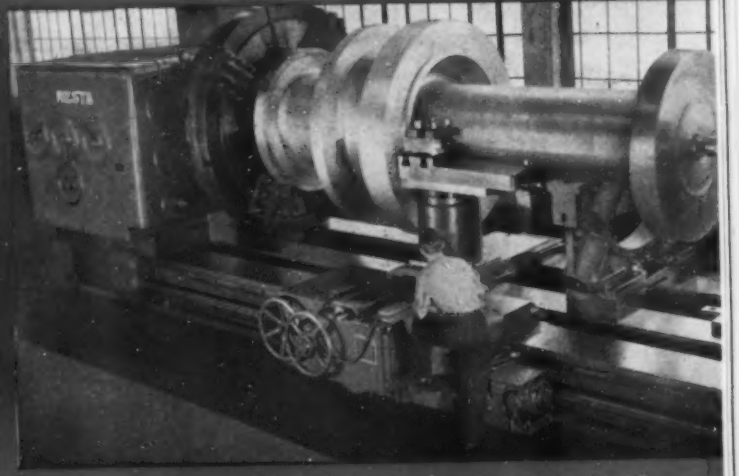
MESTA

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



SIMULTANEOUSLY MACHINING ROLLING MILL HOUSINGS IN PAIRS ON MESTA HEAVY DUTY DRAW-CUT SHAPERS



TURNING A MASSIVE ROTOR SHAFT FORGED FROM INGOT POURED IN THE MESTA OPEN HEARTH DEPARTMENT

ordered a new locomotive, engineers of Davenport Locomotive Works of Davenport, Iowa, came up with a new design to meet these special conditions.

Clearance limits demand a narrow width—7 ft 3 in. and a low overall height of 9 ft 6 in. Sharp curves required a short wheel base of 6 ft 3 in. and a short length over bumpers of 21 ft. The locomotives will negotiate a minimum radius, 32 ft curve. Tractive effort at 30 pct, adhesion is 39,000 lb.

Plenty Of Power

Equipped with two Cummins engines, two Westinghouse generators and two Westinghouse motors, the locomotives also have air throttles, straight air brakes, two Gardner-Denver compressors and traction motor blowers.

The wheels are 33 in. tires on cast steel centers and are provided with roller bearings. Fire fighting equipment is installed as well as an automatic alarm for indicating radiator high temperature and low water.

MACHINE DESIGN:

Add new features to combination boring, drilling, milling unit.

Several new engineering ideas designed to improve machine performance and provide greater operating convenience have been incorporated in the Giddings and Lewis underarm machine. The unit is a combination horizontal boring, drilling and milling machine.

Bolted to the bottom of the headstock, the arm is completely encased in a housing which lengthens the bearing surface of the headstock on the column by 14 in. This additional surface contributes greatly to underarm rigidity and load distribution, permitting heavier cutting operations at greater distances from the face of the headstock.

Treadle Locks Underarm

Addition of a foot treadle clamp, used to lock the underarm in position, gives greater operating convenience to the operator. The underarm is clamped into position by simply pressing down on the left side of the treadle.

By depressing the opposite side

the underarm is released. Control of the lever can also be obtained from the floor by inserting an ordinary hand-rod into the treadle.

A telescopic sight for reading scale and vernier settings on the machine runway or underarm to the thousandth inch also saves steps for the operator. A periscopic arrangement permits the operator to read either the scale on the ram or the scale on the column runway while operating the machine.

Has Built-in Crane

Feed lever for the new G & L underarm is now within easy reach of the operator's platform. This lever permits the operator to hand or power feed the underarm or spindle at either a 1 to 1 or 6 to 1 ratio. Predetermined movement of the underarm's in-or-out travel can be set by means of a conveniently located dial containing the limit stops.

The machine is now equipped with a 2-ton crane for fast, efficient lifting and positioning of the underarm machining attachments.

CORROSION PROTECTION:

Compressor piston rods sprayed with stainless for longer life.

Life expectancy of compressor piston rods used, without lubrication, in corrosive chemical installations has been substantially improved by metallizing the rods with stainless steel, a maker of compressors has found.

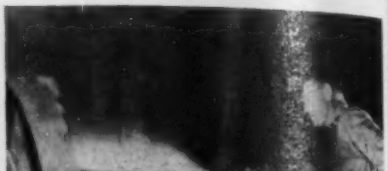
The big compressors are used in chemical plants and pipeline installations where gases are often highly corrosive, due to the presence of sulfur or other elements, and make maintenance a definite problem.

Use No Lubricant

Since the rods must be operated without lubrication to prevent contamination of the gases, galling and subsequent damage to the packing frequently occurred. Also, since the rods are used in double-end cylinder compressors this permitted leakage of the product and contamination of the air.

The company originally tried

Turn Page



STAINLESS STEEL sprayed over worn metal shafts improved service life in corrosive conditions, led to discovery life of new parts could also be extended.

metallizing on shafts returned by users for reconditioning. Records showed these rods lasted several times longer from the standpoint of diameter loss and that galling no longer occurred. Damage to packing and leakage were also eliminated.

Use Carbon Steel Rod

Based on this experience it was decided to metallize all new piston rods to be used for corrosive gases.

Several sizes of compressors are made in 2, 3, and 5-cylinder models from 12 in. bore x 14 in. stroke to 30 in. bore x 48 in. stroke. The rod shown in the picture is 4 ft 8 in. long and 3 in. in diameter for most of its length.

Procedure is to undercut the shaft 0.030 in. undersize on the radius, thread this an additional 0.025 in. deep, 14 per inch. Threads are then prepared with a special shaft preparing tool and the surface metallized with stainless, allowing 0.025 in. for finish grinding.

Gas Gives Better Can Seal

A burst of commercial carbon dioxide in the headspace of cans of aluminum paint is being used to provide a better seal. The method, developed by American Can Co. is being used by Permite Paint Div., Aluminum Industries, Inc., Cincinnati.

Unlike air, compressed in the can sealing operation, the carbon dioxide is absorbed by solvents. This leaves a vacuum partial. Greater pressure on the outside of the can insures that all contents remain in the can.

—Technical Briefs—

CONTINUOUS CASTING:

Experience with pilot plant steel production described.

A commercial production continuous casting machine for steelmaking is in the design stage, W. B. Pierce, vice-president and technical director of Allegheny Ludlum Steel Corp., recently told steelmen at a regional meeting of the American Iron and Steel Institute in New York.

Reviewing the company's four year experience operating a pilot plant, Mr. Pierce told steelmen "the process should not be sold short."

Bypasses Many Operations

The continuous casting operation completely bypasses pouring into ingots, heating in soaking pits, and the first steel mill rolling operation, the rolling on the blooming mill. Continuous casting has long been a regular practice in the nonferrous metals industry. There is no commercial production plant in operation on steel in the United States today. One is under construction in Canada at the moment.

Allegheny-Ludlum is considering equipment that has 150 sq in. of mold cross-section capacity. Continuous Metalcast Corp., holder of basic patents in the field, is assisting in the design work; as is the Freyn Engineering Division of the Koppers Company.

Specifications call for the unit to produce up to 20 tons per hour as a single-strand caster, and double that amount when operating as a two-section unit.

Cast Alloy Steels

After four years of operation, Allegheny-Ludlum is regularly casting numerous steel-base alloys in a variety of shapes, consistently good in quality.

The pilot plant is supplied with hot metal from an induction heating furnace at the top of the pouring tower. In a production machine, this would probably be replaced with another system. Tests to date indicate that a large quantity of metal can be held at a uniform temperature in an insulated ladle with a burner in the top.

Turn Page

—Technical Briefs—

HYDRAULIC FLUID:

Fire resistance, top efficiency combined in new fluid.

Lessons from the recent tragic fire in a Detroit autoplant have given increased emphasis to management thinking and to new developments aimed at reducing plant fire hazards.

One recent new development is designed to meet the ever present fire hazard existing in operation of large hydraulic equipment. A new nonflammable hydraulic fluid combines maximum fire resistance with top hydraulic efficiency.

Snuffer-type Material

This fluid, Houghto-Safe, is said to satisfy the need for a safe, nontoxic, noncorrosive liquid that can be used in hydraulic equipment operated near open flames or adjacent to extreme heat conditions.

The fluid is a water-base, "snuffer-type" material introduced by E. F. Houghton & Co. of Philadelphia after five years of research and testing. It has been rated as an "acceptable hydraulic fluid from the fire hazard standpoint" by the Factory Mutual Engineering Div of Associated Mutual Fire Insurance Cos.

Pumps At Low Temperatures

In exhaustive hydraulic pump tests, this new fluid has shown the lubricating ability of high grade petroleum hydraulic oils. It will not freeze and is easily pumpable at working temperatures down to 0°F.

High oxidation stability assures longer service life. It will not attack synthetic rubber packings. Viscosity index of the liquid is 150, indicating resistance to viscosity changes at varying temperatures.

Safe to 1000 psi Pump Pressure

Applications include such equipment as diecasting machines, hydraulic foundry equipment, coke oven door closers, hydraulic forging presses, hydraulic glass form-

Turn to Page 150

ing equipment, ingot manipulators, fork lift trucks operating near furnaces or hydraulic clamping fixtures of welding equipment, etc.

Laboratory and field tests show that new fluid can be used efficiently at 1000 psi pump pressure. Film strength tests indicate it will carry 2½ times the load of conventional petroleum hydraulic oil of similar viscosity. In addition, the liquid will not separate or break down under increased pressures, it is claimed.

MINING:

Better instruments can aid development of "lean" resources.

Need for more fundamental studies on the distribution and relationships of elements in the earth's crust will be filled by development of new and improved prospecting instruments, scientists of Battelle Memorial Institute believe.

The knowledge that some natural iron sulfides contain cobalt and nickel, or that tin, tungsten, tantalum, and columbium may be found in or near light-colored igneous rocks called granites provide only rough ideas about the distribution and relationship of elements in the earth's crust.

More basic laboratory research in mineralogy and crystal chemistry would bring a better understanding of why ore is where it is and, indirectly, aid in selecting the most promising areas for survey.

Many opportunities exist for improving present prospecting instruments. Miniaturization of commonly used geophysical instruments could lead to useful information in bore-hole analyses.

Extensive depletion of rich mineral deposits has caused the modern prospector to think more of searching for deposits that are lower in grade, buried deeper below presently mined surfaces, or hidden in areas previously considered impractical for prospecting.

Technical Briefs

RADIO INTERFERENCE:

Mobile units check plant compliance with FCC regulations.

Precise measurement of radio interference caused by industrial high frequency equipment has been simplified with uniquely equipped mobile units. The test instruments, housed in station wagons, can make precise field measurements to determine compliance with Section 18 of Federal Communications Commission regulations.

The units, developed by Thermatron Div., Radio Receptor Co., Inc., New York, are handled by two-man crews. They can rapidly cover large areas around the plant to check interference in a minimum of time.

Pinpoint Trouble Spots

Plants equipped with high frequency installations often receive complaints from residents in the area who are plagued with radio and television interference. The field units can quickly pinpoint the trouble to determine if the plant equipment is actually at fault.

The cars have two antennas mounted on the top and two sets of instrumentation behind the driver's seat that cover the range from 15 mc to 300 mc. In order to allow the car to travel on all roads and without structural interference the low frequency antenna is an adjustable dipole mounted on a retractable mast.

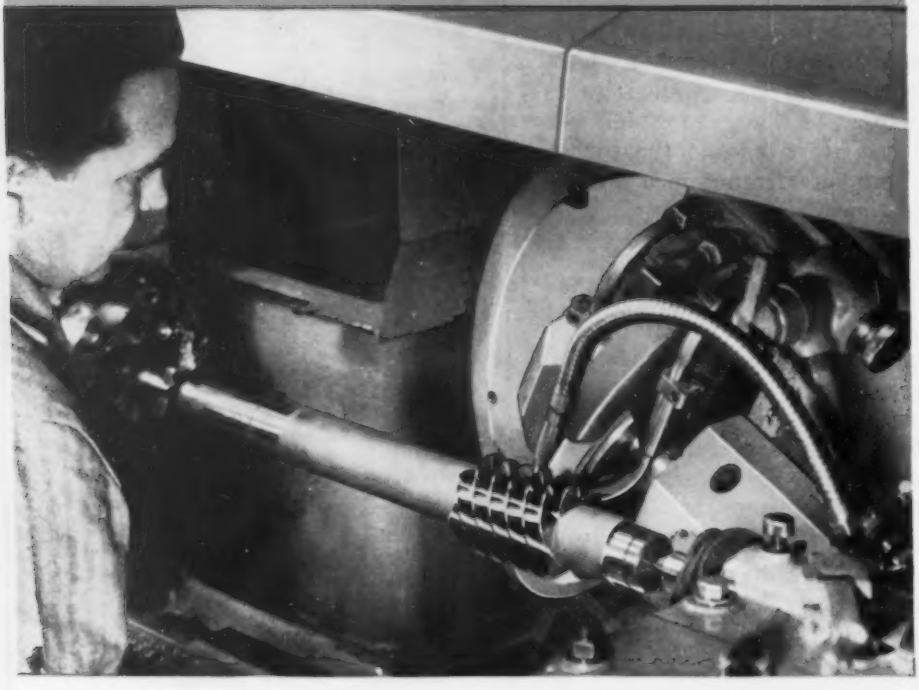
Use Hinged Mast

When in use, the mast is swung into vertical position. Controls at the base of the mast permit remote adjustment of azimuth and the plane of polarization. When not in use the mast is swung easily into horizontal position permitting the vehicle to travel. The high frequency antenna is a broad-band biconical dipole mounted on a separate portable mast.

To facilitate the work there is a two-way radio-telephone link between the field car and plant.

Grinding 5-Start Worm with 4" Lead

STANDARD STYLE 36 EX-CELL-O *Precision* THREAD GRINDER



In the photograph at the left the operator is grinding a worm shaft for use in a special machine. The part is about 22" long and the worm is 4½" long, 3.430" O.D., has 5 starts, a pitch of .800", a lead of 4" and a tooth depth of .5454". The worm was ground in two operations on a standard Style 36 Thread Grinder. It was rough ground from the solid, hardened, then finish ground.

For complete information and specifications on the Style 36 and other Ex-Cell-O Thread Grinders contact your local representative or write today to Ex-Cell-O.

XLO

EX-CELL-O *for* PRECISION

A COMPLETE LINE OF PRECISION THREAD GRINDERS

STYLE 50
Precision Thread Grinder—a versatile machine for external work, also available with internal attachment.

STYLE 33
Precision Thread Grinder—a high production machine for external work.

STYLE 39-A
Precision Thread Grinder—a high production machine for internal threads.

STYLE 36
Precision Thread Grinder—a versatile machine for extra long external threads, available with internal attachment.

EX-CELL-O CORPORATION • Detroit 32, Michigan

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

53-35

THE IRON AGE SUMMARY...

- **Fourth quarter steel decline has been over-rated**
- **Contract negotiations may spell trouble next year**
- **Scrap prices rebound after long, steady decline**

Despite a moderate decline in the fourth quarter, the steel industry is a cinch to break its best previous production record by a wide margin this year. Barring unexpected trouble, total production this year should come very close to 112 million net tons of ingots and steel for castings.

That would be about 7 million tons higher than the industry's best previous record of 105.2 million tons poured in 1951. It would be nearly 19 million tons higher than last year's output which was held at 93.2 million tons by a 54-day strike.

The fourth quarter decline in steel business has been greatly over-rated by some of the so-called experts. While some of them were crying "wolf" at the dire things they saw in their crystal balls, the steel industry was taking an inventory correction pretty much in stride.

Outlook now is that fourth quarter business will be only a shade below third quarter. This optimistic forecast is based on the fact that cancellations of orders are now diminishing.

Inventory correction appears to be over the hump, although some consumers will continue to regulate their stocks over the next several weeks. Far from being discouraged by these adjustments (which they knew must come sooner or later) steel officials are happy they have been able to absorb them with a minimum decline in operations.

Cutbacks of some inventories may have been sharper than was justified. This is indicated by a few cases where new shipment orders have been received after old orders were cancelled or ordered held up.

Prospects for steel business in the early part of next year are bright. But if business is good it will be at a price. The United Steelworkers of America is carefully mapping out a program of economic gains to present to steel companies before most of their contracts expire in their entirety June 30.

It would be almost a miracle if a completely new contract could be negotiated without at least a threat of strike. Good steel business would strengthen the union's hand. And the stronger the union's hand, the greater will be the threat of strike loss of steel production.

So the union will watch economic developments closely before it reveals its demands. But it is known to be building a case for at least four big economic gains—in addition to other contract changes.

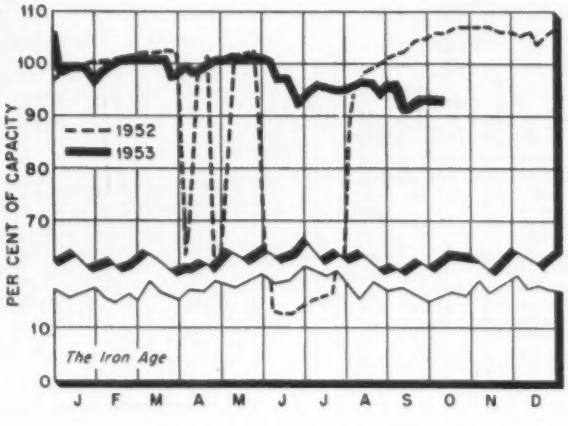
High on its list of demands will be: (1) Boost in pensions from present $100 per month for 25 years' service to $150 per month (union officials are determined to top the $137 per month won by autoworkers). (2) Improvements in social insurance. (3) Guaranteed annual wage (this may again be traded off for gains in pensions or social insurance, but there'll be a lot of noise made over it.) (4) A cents-per-hour wage increase—size of demand to be determined by economic conditions.

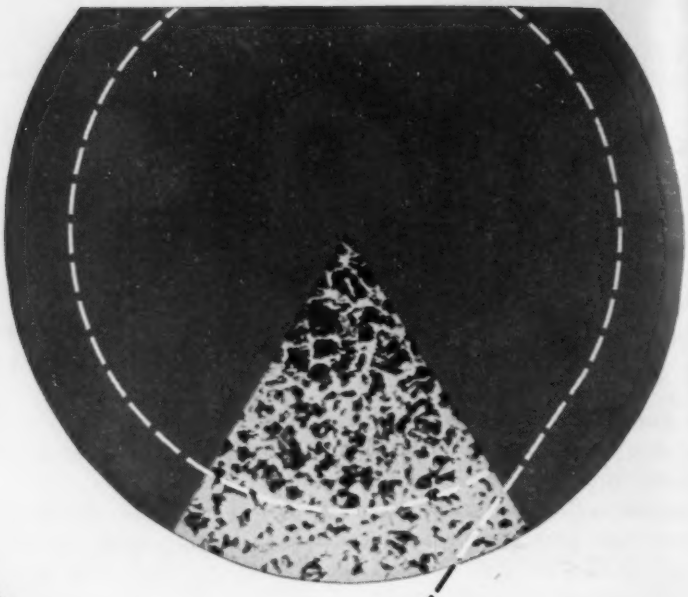
The mystery of falling scrap prices was cleared up this week when prices rebounded in several important market areas. Increases raised THE IRON AGE Steel Scrap Composite Price $1 a ton to $32.33 per gross ton.

Steel Operating Rates

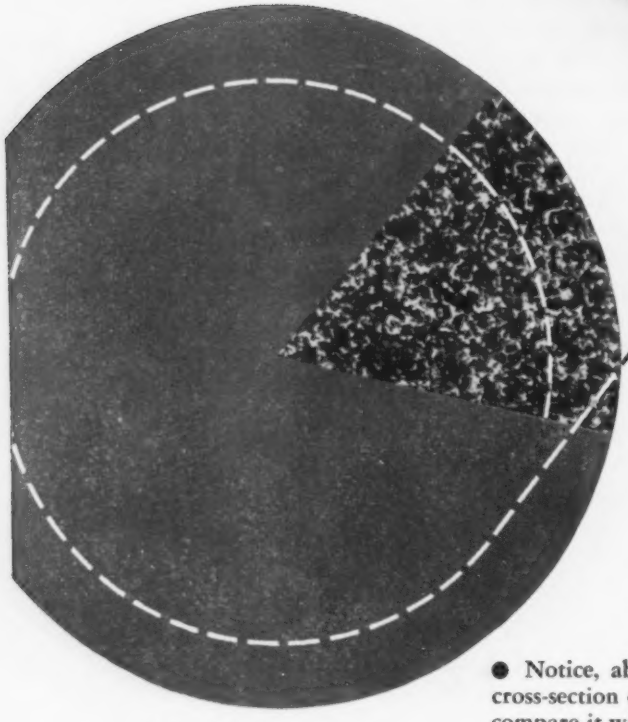
	Week of Oct. 11	Week of Oct. 4		Week of Oct. 11	Week of Oct. 4
Pittsburgh	97.0	98.0	Detroit	92.0	94.0*
Chicago	97.0	97.0	Birmingham	96.5	96.5
Philadelphia	96.0	96.0	Wheeling	97.0	98.0
Valley	96.0	96.0*	S. Ohio River	81.0	82.5
West	97.5	95.5	St. Louis	100.5	103.0
Cleveland	94.0	94.0*	East	100.0	87.0
Buffalo	106.5	106.5	AGGREGATE	95.0	95.0

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.
* Revised





The "decarb" (light-colored) area in the ordinary heat-treated bar at right must usually be removed before parts can be made from the stock.



Notice that this Republic carbon corrected alloy steel bar has had full carbon content restored to outer edges by carbon correction.

HERE IS WHERE Republic Carbon-Corrected Alloy Steel Bars help you make a profit

● Notice, above at the right, the "decarb" area in the outer edge of the cross-section of a cold drawn alloy steel bar as ordinarily heat treated. Then compare it with the cross-section below at the left. Notice how the carbon has been restored by carbon correction even to the extreme outer circumference.

Here, in the outer rim of Republic Carbon-Corrected Alloy Steel Bars, is the profit-area for your machine tools . . . the part of the bar you don't have to machine away into chips and shavings.

Let our Republic 3-Dimension Metallurgical Service work with your metallurgists and production men to adapt Republic Carbon-Corrected Cold Drawn Alloy Steel Bars to your products. Your Republic Steel salesman can arrange for the Republic Field Metallurgist to call at your convenience.

LAB FIELD MILL

3-DIMENSION Metallurgical Service

. . . combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic COLD DRAWN
REPUBLIC STEEL
ALLOY STEEL BARS

Markets at a Glance

Pig Iron Soft . . . Market for pig iron has been weakening recently and some prices have been cut. Reason for the market softness is dip in operating rates of several big steel producers which has placed more pig on the market. Although foundry business is fair, foundry men cannot absorb all the pig now available.

Reduce Prices . . . Granite City Steel Co. recently reduced prices on steel plates and sheets. The price cut on carbon steel plates amounted to $6 per ton, while hot-rolled carbon sheets, 18 gage and heavier, were reduced $2.50 per ton. Cold-rolled carbon steel sheets were cut $5.40 per ton.

Scrap Strenghtens . . . After 10 weeks of sliding prices, the steel scrap market bounced back vigorously in some areas. THE IRON AGE Steel Scrap Composite rose $1 from $31.33 to $32.33 per gross ton.

Switch to Nickel-Bearing Stainless . . . Decontrol of nickel (see p. 53) will cause consumers to switch from chrome stainless back to the nickel-bearing stainless they were using before controls were invoked. Warehouse inventories are believed to be fairly good.

Figures Not Always Facts . . . Although the steel industry's operating rate last week was down about 12 pct from the same week in 1952, actual production is only about 4 pct less as a result of the industry's increased expansion. This fact was pointed out by Edward Ryerson, chairman, Inland Steel Co., at a meeting of the American Iron and Steel Institute last week.

U. K. Cuts Steel Price . . . Despite strong domestic demand, Britain has cut export prices on steel plate 15 pct. Reason for the price drop is weakness of the international market and recent agreement by producers in France, Germany, Belgium and Luxembourg to lower their minimum export price for plate about $10 per ton.

Drop Diamond Wheel Controls . . . Controls on use of diamond grinding wheels were lifted last week with the revocation of National Production Authority Order M-103, in effect since March 1952. No provision was made for military setasides, but manufacturers have agreed to give preference to military and atomic energy orders.

More Decontrol Coming . . . It was expected that some time this week an order would be issued decontrolling columbium, tantalum, columbium-bearing and tantalum-bearing steels. Effective date will probably be Nov. 1 to coincide with nickel decontrol.

Carryover on Structural Orders . . . Wide flange structural and plate supplies are still tight at the mill level. At least two midwestern mills say they will have to carry over heavy structural orders into first quarter '54.

First Barge Shipment . . . Pittsburgh Steel Co. this week moved its first barge-load of hot-rolled sheets, a 630-ton shipment, which will be sent to Houston. Pittsburgh Steel recently began production of hot-rolled sheets at its new sheet-strip mill at Allenport, Pa.

Tinplate Weak . . . As predicted several months ago, the tinplate market has turned soft. Cause of the weakness is heavy consumer buying earlier this year when users stocked up as a hedge against a possible strike. Some mills have cut tinplate production and increased sheet output, and now the sheet market is showing signs of slumping.

Set Scrap Export Quota . . . An export quota of 50,000 tons of domestic steel scrap has been licensed for export during the fourth quarter, an increase of 5000 tons from the third quarter. Commerce Dept. said scrap licensed against this quota will be for shipments to Mexico.

Prices At A Glance

(cents per lb unless otherwise noted)

Composite Prices	This Week	Last Week	Month Ago	Year Ago
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy. (gross ton)	$32.33	$31.33	$37.17	$42.00
Nonferrous Metals				
Aluminum, ingot	21.50	21.50	21.50	20.00
Copper, electrolytic	29.50	29.50	29.50	24.50
Lead, St. Louis	13.30	13.30	13.80	13.80
Magnesium, ingot	27.00	27.00	27.00	24.50
Nickel, electrolytic	63.08	63.08	63.08	59.58
Tin Straits, N. Y.	80.00	82.25	81.13	$1.21⅝
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Charge Monopoly in Lead Industry

U. S. files suit against two largest lead firms . . . Chile copper situation coming to head . . . Price reported 30¢ per lb . . . Zinc stocks up 23,600 tons—By *R. L. Hatschek.*

Trust-busting headlined the nonferrous news again last week when Attorney General Herbert Brownell announced the filing of a suit against American Smelting & Refining Co. and St. Joseph Lead Co. The suit charges the two firms, the largest U. S. lead producers, with violations of the Sherman Antitrust Act.

Both firms declined to make any comment until they had received the complaint officially from the government.

Lead Monopoly Charged . . . The suit, filed in the U. S. District Court for the Southern District of New York, alleges that the two firms have restrained, attempted to monopolize and monoplized interstate and foreign trade in the production and sale of primary lead.

Attorney General Brownell stated that, "The primary lead industry of the U. S. has been so dominated by the two defendents that no new producer has entered the industry for almost 35 years."

The market, meanwhile, remained quiet with the trade indicating that total sales for September shipment were at the lowest point for months.

Change Cabinet . . . An unofficial report from Santiago states that as soon as a new Chilean cabinet is formed a contract will be signed selling Chile's surplus copper to the U. S. Quantity is set at 100,000 tons and the price, according to the report, will be 30¢ per lb. Chilean Foreign Minister Oscar Fenner declined early this week to confirm or deny the 30¢ price.

Things have been popping in the Chilean news. The cabinet resigned following the result of an election which went heavily in favor of an anti-government candidate.

Revalue Peso . . . Producers of copper in Chile are expected to get a better deal as a result of last week's revaluation of the peso. The International Monetary Fund has okayed the shift from 31 to 110 pesos to the dollar and it's anticipated that the copper producers will no longer be held to the arbitrary rate of 19.37 pesos to the dollar.

While the situation hadn't completely gelled at presstime, it was expected that most aspects of the U. S.-Chile deal would be cleared up shortly. Main thing left will be the effect on the world copper market of the renewed flow of red metal from Chile.

Zinc Stocks Zoom . . . THE IRON AGE last week reported significant cutbacks in slab zinc smelter production. A look at American Zinc Institute's statistical picture for September shows the reasons behind the actions.

Stocks at the end of the month had soared some 23,600 tons to 141,494 tons, the highest point since August 1947. Production for the month continued at about the same rate that has prevailed for the past year. But shipments dropped 11,700 tons—the fifth consecutive month of decline—to 57,547 tons. Order backlog has declined to 27,323 tons.

Meanwhile the market remained very dull with unchanged prices.

Secondary Aluminum Dips . . . Ingot makers this week are quoting remelt aluminum at generally lower figures than last week. Steel deoxidizing grades took the biggest slump, off anywhere up to 1¾¢ per lb. Other grades were anywhere from unchanged to off ¾¢ per lb. In several areas scrap buying prices of ingot makers and scrap dealers were also quoted lower.

The reverse is generally true of copper and copper base scrap. Custom smelters and ingot makers have edged their buying prices a bit higher—up to 24½¢ per lb for No. 1 heavy copper and wire in some cases. Dealers, previously buying No. 1 copper in the range of 21¢ to 22¢, have swung to the high side and are now quoting a flat 22¢.

Nickel Free . . . Following the U. S. action, Canada has ended controls on primary nickel sales. It is no longer required for users to get their orders okayed by Canada's Defense Production Dept. The action was attributed to the ending of International Materials Conference allocations of nickel and a generally better supply-demand picture.

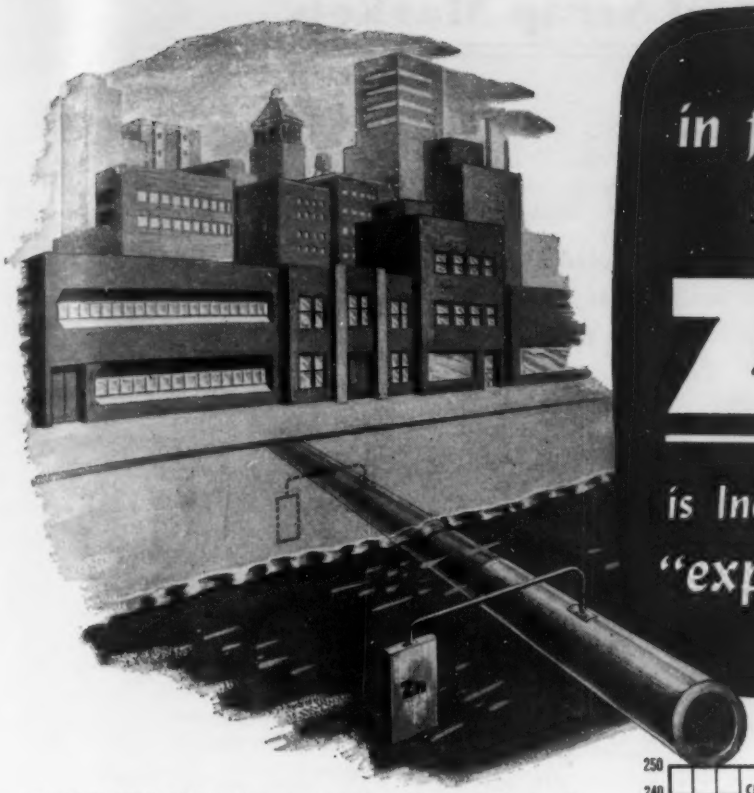
In the U. S. order M-80 has been officially discarded, effective Nov. 1. (See p. 53.)

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Oct. 7	Oct. 8	Oct. 9	Oct. 10	Oct. 12	Oct. 13
Copper, electro, Conn.	29.00–30.00	29.00–30.00	29.00–30.00	29.00–30.00	29.00–30.00	29.00–30.00
Copper, Lake delivered	30.125	30.125	30.125	30.125	30.125	30.175
Tin, Straits, New York	81.50	81.25	80.50	....	80.00	80.00*
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10.00	10.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices
*Tentative

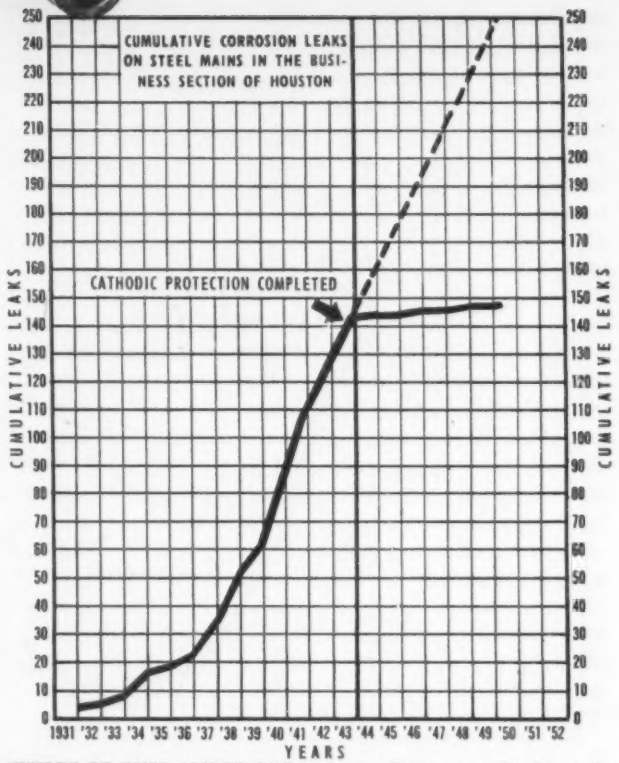


in fighting corrosion with corrosion— ZINC is Industry's most effective "expendable" weapon!

NEARLY 50% of all the zinc consumed annually in the United States — around 400,000 tons — is used in galvanizing, i.e., protective zinc coating on iron or steel. This is ample evidence of the metal's firmly established position as industry's most effective and economical "sacrificial" weapon in its unceasing combat with rust. The electrochemical reaction between iron and zinc in galvanizing is precisely the same as that which takes place in the relatively new and growing use of zinc for cathodic protection of pipe lines and other underground iron and steel structures. The sole difference between the two methods being that in cathodic protection the zinc, in the form of anodes, is buried adjacent to a pipe line and connected by a conductor, while in galvanizing the zinc is bonded to iron or steel. In either form, zinc "protects"— as has been attested to by those progressive companies who have used zinc anodes for this purpose. For example in the northwest, a utility company reports:

> *"The most interesting installation was made in 1942 on four inch bare pipe located in the seepage from an irrigation ditch that circled the brow of a hill in such a manner that the pipeline trench intersecting the irrigation ditch was kept moist throughout the season. Approximately seven hundred feet of this four inch line had been replaced twice. In the spring of 1942 leakage developed and when the pipe was uncovered it was found to be in bad condition. Pending replacement, repairs were made and seventeen zinc anodes were installed with series-parallel connections. In the press of other work, this replacement job was put aside and in 1943 it was found that no further leaks had developed. In 1948 the replacement had still not been made and we were getting a good potential-to-ground and plenty of protective current. The last test made in the spring of 1950 shows a slight increase in the potential-to-ground and the pipe has not been replaced nor have we felt it even necessary to uncover it for visual inspection."*

The graph at right provides additional evidence from the State of Texas. Here are two examples, under widely dissimilar conditions, where zinc has proved itself as a highly efficient cathodic protector for underground pipe lines. This is not surprising in view of the long-recognized superiority of the metal in the field of galvanizing.



EFFECT OF ZINC ANODE PROTECTION ON OLD LINES. *Most of the United Gas Corp.'s welded-steel-gas distribution mains, coated with hot asphalt and asbestos wrapper, were installed before 1930. Cathodic protection of mains with zinc anodes was completed in early 1944. Curve shows cumulative leak record of these mains. Only 5 corrosion leaks occurred in the 6 years since cathodic protection was applied, comparing with 142 during 1932-1944.*

Market Takes On Healthier Hue

Several areas see 10 weeks' downtrend as ended . . . Market generally firm . . . Iron Age composite rises $1 to $32.33 . . . But price boosts not universal . . . More orders needed.

It couldn't be called a definite uptrend just yet. But many trade sources felt the market had turned, was noticeably firming. Price advances were scattered, both in grade and area, but strong enough to reverse the downward trend of the last ten weeks, boost THE IRON AGE Steel Scrap Composite $1 over last week's quotation to $32.33.

Biggest increase was registered in Pittsburgh, where No. 1 heavy rose $2 to a top of $36, and No. 2 steel and bundles went up $4 to $32 and $30 respectively. Cleveland reflected the adjacent activity when No. 1 steelmaking grades rose $1 and No. 2 items $2. Similarly, in Chicago, several grades went up about $1.

Even in areas where no price rises were recorded, the general tone of the market seemed healthier to trade observers. Reactions ranged from relief that bottom had been reached to cautious optimism.

Warning from the Army: Scrap shipments from overseas should be carefully watched for explosives. While shipments are presumed to be decontaminated before loading, experience has shown that scrap containing explosives does sometimes arrive in the U. S. Army personnel are available on a cost basis to assist in decontamination and to train civilian workers.

Pittsburgh—Scrap prices turned upward this week on strength of a purchase by an independent mill. No. 1 heavy melting steel was up $2 to $36, top, while No. 2 steel and bundles were up $4 to $32 and $30, respectively. Other grades moved up in sympathy as the market bounded back after weeks of weakness. The new purchase indicated that the recent low point did not reflect a realistic market condition. Some brokers are losing up to $4 per ton filling $28 and $26 orders for No. 2 steel and No. 2 bundles.

Chicago—This scrap market, in an almost complete absence of large consumer buying, was beginning to tighten last week. While rail grades continued to move into a more normal relationship with other grades, cast perked up a little, and brokers were paying good prices to dealers for steelmaking grades. Industrial scrap received a shot in the arm, and even turnings were holding fairly firm. Electric furnace grades were not particularly improved at press time. Upturn didn't particularly follow the eastern advances in mill price, but apparently began at the broker level locally in the middle of last week. Instances were reported of dealers receiving $1 and $2 over last week's consumer prices in broker sales.

Philadelphia—The scrap market in this area has stiffened up considerably during the past week. Prices are generally the same, though low phos and railroad grades climbed, but the trade claims that the rock bottom prices recently quoted have just about destroyed collection machinery. Cautious optimism is again being felt despite mill buyers' generally resting on good inventory.

New York—Prices continue low and movement lower in this area, but the trade was generally heartened by reports of firmer markets and higher prices in other districts. Several dealers emphasize that collection machinery can't work at present price levels. One dealer reported that some scrap producers are refusing to sell, expecting prices to rise before storage space overflowed.

Detroit—A series of token orders by major consumers here are having the effect of stabilizing the market although not much actual tonnage is moving. Turnings continue to be sick and there are no real orders in sight. There is little optimism about the prospect of a rising market, just relief that the bottom may have been reached. Price changes reflect only adjustments to normal differentials.

Cleveland—Recent openhearth buying in adjoining areas has resulted in sympathetic price increases ranging from $1 on No. 1 heavy melting to $2 on No. 2 steel and No. 2 bundles. With exception of blast furnace grades, which remained strictly nominal, most other grades advanced $1. Although activity in the open market is at a standstill scrap had definitely firmed up at the dealer level.

Birmingham — Some steel scrap moved in the district this week to two southern mills. The largest buyer in the area was in the market for limited quantities of blast furnace scrap, while a Georgia mill bought No. 2 heavy melting at $26.00 a ton, delivered Atlanta. This cut brought the Atlanta price to a level with Birmingham. List prices on railroad scrap in the district now are from $4 to $10 under last month.

St. Louis—Railroad offerings totaling 12,800 tons of scrap were absorbed readily by the trade and consumers in this district. Prices were in line with quotations previously given, with a few items bringing slightly better and a few slightly less. Inventories of mills are still large, halting heavy buying until they drop.

Cincinnati — Limited buying at slightly higher prices has resulted in an across the board increase of $1 in scrap prices here. Dealers and brokers generally expect further increases as outlook for local consumption in November brightens.

Boston — Prices edged slightly higher on several grades in the New England scrap market last week and things are generally more stable. But the trade is not happy as business is practically nil.

Buffalo—A better undertone prevails in the scrap market here in view of higher prices elsewhere. All leading mill buyers continue on the sidelines. The top mill partially lifted its embargo on shipments, is now accepting delivery on the same restricted basis as the second largest consumer. There is no sign of any large new order.

West Coast—Cast in San Francisco grows progressively weaker as a strike in a pipe firm continues. The market is considerably stronger in Los Angeles with some difficulty meeting requirements. Steel scrap prices unchanged with southern California collections poor last week due to heat.

The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Nursing Pennies . . . If the experience of electrical equipment dealers in the Pittsburgh area means anything, steel producers have taken to nursing their pennies. The steel mills simply are not buying.

A leading dealer in this district reports his business is at the lowest ebb in the last 5 to 6 years. This is partly due to a slump in coal mine activity but results mostly from the lack of steel mill purchasing.

It looks as though this conservative attitude of the mills will continue through the balance of the year. A check with maintenance engineers attending a recent meeting of the Assn. of Iron & Steel Engineers in Pittsburgh indicated that budgets for replacement and standby electrical equipment have been pared to the bone.

Future Brighter, Maybe . . . Steel producers are apparently doing just what some of their customers are doing—reducing inventories, cutting costs wherever possible to prepare for more competitive conditions.

Dealers in steel mill equipment are anything but enthusiastic over current business, although some feel that prospects for the future are good.

Miscellaneous equipment dealers refer to business as spasmodic. Fourth quarter outlook is not too bright. Shears and brakes are in good demand. Machine tools will move if dealers are in a position to acquire newer types and models. Customers are more insistent on good price and quality.

Hard to Get . . . California used machinery dealers optimistically report a favorable outlook for the rest of the year. This is in spite of the fact that good used tools are still hard to come by—and then only at a high price which forces the resale price to within 15 pct of new equipment prices.

Government stretchouts on such items as radar equipment, ordnance and some aircraft work is enabling prime contractors to do the work themselves. The mass of small marginal shops are getting a smaller volume of subcontract business. So tools purchased for this are expected to become available for resale.

Prices are expected to decline as a result of the lower demand and this might entice others to buy used equipment. Some of the shops which are losing out on the subcontracting will be returning to their normal commercial output. This may require redesign of some tooling to capture neglected markets which would help bolster used tool sales.

East Coast, Too . . . Situation reported by dealers in Philadelphia is much the same—only they aren't so optimistic. Business, in general, is pretty slow with both buying and selling at low levels. Supply of modern equipment at reasonable prices remains the bugaboo.

Quite a few plants are reported to have idle machinery. But they won't sell it unless they get a really attractive price. Many are just sitting on their hands waiting to see which way the business winds decide to blow. And nobody expects any significant change in the situation for several months.

Plants that are in the market for tools are not pushing for deliveries. They aren't pressing production rates. Others prefer to wait for new tools and the import market is very slow. Some shops that had tools on order have cancelled and inquiries are slow.

What's in Demand . . . In general, the trend is away from specialized production type tools and toward versatile standard shop equipment. Multiple spindle automatics, milling machines and radial drills head the list of most wanted machines. And sales volume would improve if dealers could bolster their stocks.